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FUNGUS INFECTIONS OF THE HANDS AND FEET.*

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NEW ORLEANS.

INTRODUCTION

Having studied a great many chronic inflammatory lesions of the hands and feet by various laboratory means with a view of establishing the etiologic factors concerned in their production, I have come to the conclusion that the groups of microscopic plants represented by the higher bacteria and fungi are much more commonly concerned in the production of lesions in these exposed portions of the body than we have been wont to consider them. For instance, Stelwagon,(1) in that familiar text-book of American physicians, "Diseases of the Skin," states that fungus infections, ringworm in particular, may *in rare instances* show themselves on the hands, fingers, feet or in the interdigital spaces. He describes onychomycosis as a comparatively "rare" disease. Sutton's book,(2) published as recently as 1926, gives a few beautiful pictures of trichophytosis of the nails, the palms of the hands and soles of the feet, but at the same time leads the reader to presume that these lesions are by no means common by the statement that such lesions "may occur."

By extending the scope of my examinations to include the nails of individuals with chronic and recurrent ulcerative lesions, of eczemas between the toes, pompholyx and eczematoid conditions of the epithelium of the hands and feet, I have been convinced that not only are many of these lesions parasitic (fungal) in origin, but that the focus of infection and *continued reinfection* of the epithelium of these parts of the body at least does occur by transplantation of fungi that are more or less continuously growing in the hornified epithelial cells comprising the nails, and particularly the toe nails. All of the members of the ringworm group of fungi are capable of living in this modified epithelium, and while the rate of growth here is almost incredibly slow, the growth extending upward toward the matrix at about the same rate as the cells proliferate and are pushed downward, they thus provide a constant source of infection over a period of years. Sequeira(3) mentions eczematoid ringworm of the toes as a "complication" of *Tinea cruris*, and that when present it may persist for years with recurrences after apparent cure of the primary lesion.

It is my belief that trichophyton infection of the nails is the common etiologic fungus of oychomycosis rather than fungi of the genus Epidermophyton, and that the majority of adults in this community and climate, at least, may be demonstrated, with the aid of the microscope, to be infected.

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Deforming dystrophies of the nails are generally supposed to be due to *inherited* diseases, trauma and occupational injuries. Infections of the nails with members of the ringworm group are supposed to produce softening of the nails with resultant erosion. With precise methods of digesting the nails and liberating and concentrating the fungi without destroying their morphology beyond accurate identification with the microscope it is really astonishing how many of these conditions may be demonstrated to represent merely the result of a fungus infection that has been present from early childhood.

The ability to "diagnose" disease in general still remains more of an art than a science in many instances in that when given a particular symptom complex one must first "suspect" a particular type of disease process and then endeavor to prove the correctness of the suspicion. This method of diagnosis applies with particular emphasis in the laboratory demonstration of the varied types of pathogenic fungi.

Considering all of the above lengthy introduction, I would like to briefly review the classification of the microscopic vegetable parasites that I have encountered in lesions of the hands and feet, pointing out the gross characteristics of the diseases and methods of search for the probable etiologic fungus, and to present a method of demonstrating fungi in skin, tissue, and nail infections that has given me the best results.

CLASSIFICATION OF FUNGI

There are a large number of various species of higher bacteria and fungi that may infest such exposed parts of the body as the hands or such well incubated surfaces of the body as the well shod feet of a denizen of the hot asphalt of our modern cities, and whose socks are usually washed "out." In general these infections fall more or less in groups, according to their botanical classification. Specific case reports are all too prone to refer to some particular species of fungus infection and the medical journal reader soon becomes impressed with the multiplicity of possible fungus infections rather than the few general types of infection really existing and representing fungi of the various *genera*. The classification of pathogenic higher bacteria and fungi as found in our current medical literature is too confused to mention. The following table is a practical working guide that has been found useful in teaching my medical students, at least.

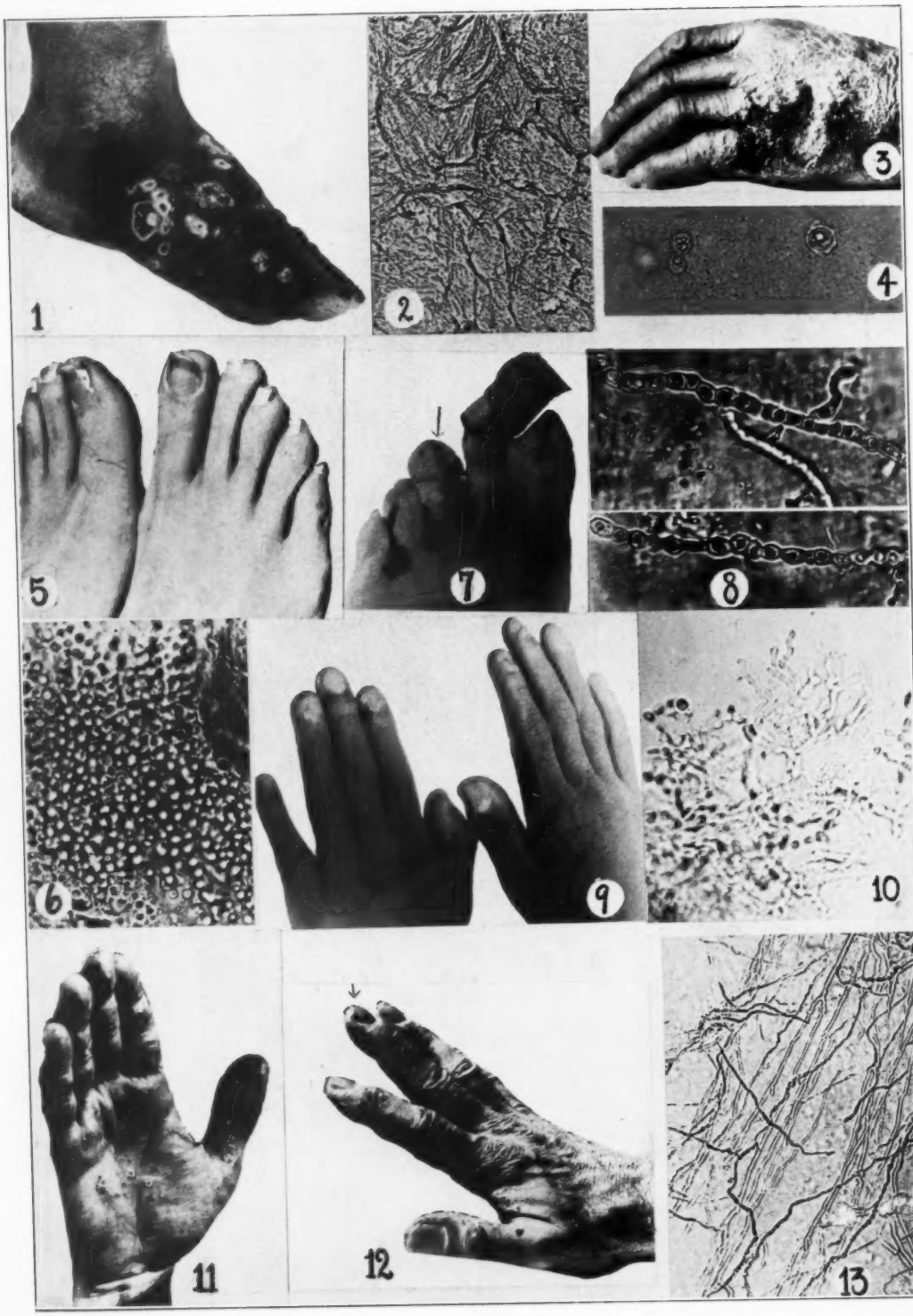
PHYLUM THALLOPHYTA

Microscopic plants or vegetables whose body includes one or many cells, form a more or less branched structure, and many varieties of which are parasitic upon man or lower animals by virtue of their ability to grow and multiply in or on the body of their host. This division of the vegetable kingdom may be divided as follows:

Group I. Schizomyetes (bacteria).
- Family 1—Coccaccae.
- Family 2—Bateriaceae.
- Family 3—Spirillaceae.

Group II. Trichomycetes (higher bacteria; bacteria growing in filamentous forms).
- Genus Leptothrix (with no branching).
- Genus Cladothrix (false branching).
- Genus Nocardia (Streptothrix) (true branching spores).
- Genus Actinocycetes (branching; no spores).

Group III. Hyphomycetes (yeasts and fungi or moulds).
- Genus Saccharomyces (budding fungi; yeast-like or simple mycelial tubes).
  - Monilia (fermenting sugars).
  - Oidia (no fermentation of sugars).
  - Cryptococci (double-walled, budding fungi).
- Genus Microspoum—M. audouini (type).
  - Parasitic in hairs and hair follicles.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Mycelia and spores (small).

Cultures have hyphae bearing sessile conidia and septate fusiform bodies.

Lesions have no scutula.

Genus Trichophyton—T. tousurans (type).

Parasitic in hair and nails and adjacent epithelium.

Mycelia, mycelial spores, and chlamydospores in lesions.

Conidial bearing hyphae in cultures.

Genus Epidermophyton—E. cruris (type).

Parasitic in skin. Does not invade hair or hair follicles.

Mycelial filaments and spores in lesions. Pluriseptate spindles in cultures.

Genus Achorion (mycelial filaments and spores producing scutula about hair shaft).

Genus Sporotrichum (Mycelial filaments or spores in lesions, and producing conidiospores in cultures).

Genus Penicillium (mycelia or spores in lesions. Fruit bearing hypha with sterigmata and conidia in culture).

Genus Aspergillus (Mycelia or spores in lesions. The conidiophore hyphae terminate into ovoid formations supporting sterigmata bearing a chain of conidia).

Genus Sterigmatocystis (Mycelia or spores in lesions. Conidiophore terminating in oval formation with primary and secondary sterigmata bearing the conidia).

PLATE I.

Fig. 1—Actinomycosis of foot.

Fig. 2—Portion of actinomycotic granule flattened out by pressure from a cover glass and viewed under the high dry (4 m.m.) lens of the microscope.

Fig. 3—Blastomycosis of the hand.

Fig. 4—Blastomycetes digested free from tissue and exudate and viewed with high dry (4 m.m.) lens.

Fig. 5—Microsporosis of toe nails.

Fig. 6—Microsporons from digests of diseased portions of nails shown in Fig. 5, and photographed with the high dry (4 m.m.) lens.

Fig. 7—Interdigital intertrigo or eczema. The toe nail indicated by arrow was also diseased.

Fig. 8—Trichophytons recovered from scrapings between the infected toes and the diseased nail shown in Fig. 7.

Fig. 9—Finger nails of a very young negro boy resembling in some respects congenital dystrophy of the nails.

Fig. 10—Enormous numbers of trichophytons recovered from portions of nails shown in Fig. 10.

Fig. 11 and 12—Recurrent parasitic pompholyx associated with erosions of the finger nails and gross trichophytic involvement of the toe nails.

Fig. 13—Trichophytons recovered from lesions shown in Figs. 11 and 12.

TYPES OF LESIONS PRODUCED BY FUNGI OF THE VARIOUS GENERA

Actinocycosis is the clinical name given to many infections by filamentous organisms of the group of trichomycetes. Some varieties, such as the true actinocycetes, are quite virulent. Practically all of them produce a *chronic suppurative process* tending to involve the periosteum and bone, and are characterized by the production of discharging sinuses with crateriform outlets. Morphologically they are long, thin, bacilliform structures and often take ordinary stains poorly (Plate I. Figs. 1 and 2). When growing in the tissue the filaments grow in huge colonies, and as the lesions are always secondarily infected with pyogenic bacteria, many of these colonies are liberated in toto by the necrosis of the tissue. For diagnosis large quantities of pus must be searched carefully for yellow, white, black or red granules which consist of enormous masses of the mycelial filaments. A plain "smear" of pus as is routinely made for microscopic examination is not sufficient to demonstrate the presence of such an infection.

Blastomycosis is a group of diseases caused by several members of the genus Saccharomycetes. The simple yeasts (monilia) often secondarily invade the necrotic tissue produced by pyogenic bacteria in open lesions, but the only common primary infection by fungi of this group that I have encountered is with Gilchrist's cryptococcus, or Cryptococcus gilchristi. This is a double-cell-walled, yeast-like or budding fungus, which produces an oval or circular lesions of the skin and subcuta-

neous tissue characterized by masses of semi-necrotic granulation tissue. These areas may coalesce to form quite an irregular pattern. Large discharging sinuses do not occur. The fungi may be demonstrated directly in preparations of the necrotic material, but are best found in larger quantities of granulation tissue digested for several hours (until barely disintegrated) in ten per cent sodium hydroxide solution and concentrated as will be described later (Plate I, Figs. 3 and 4).

MICROSPOROSIS, TRICHOPHYTOSIS AND EPIDERMOPHYTOSIS

These fungi of the ringworm group are apparently only capable of growing in the epidermis and the modified epithelium comprising its appendages, the hairs and nails. There are many different species of each of these genera and their accurate classification by means of slight morphologic or cultural differences seem to be utterly impossible. Even such a painstaking artist of nomenclature as Castellani[4] may be found using even the *generic* names rather indiscriminately in referring to epidermophytons and microsporons in various parts of his book on tropical disease. The very listing of all the names these small plants bear in the usual list of synonyms merely tends to perpetuate the existing confusion.

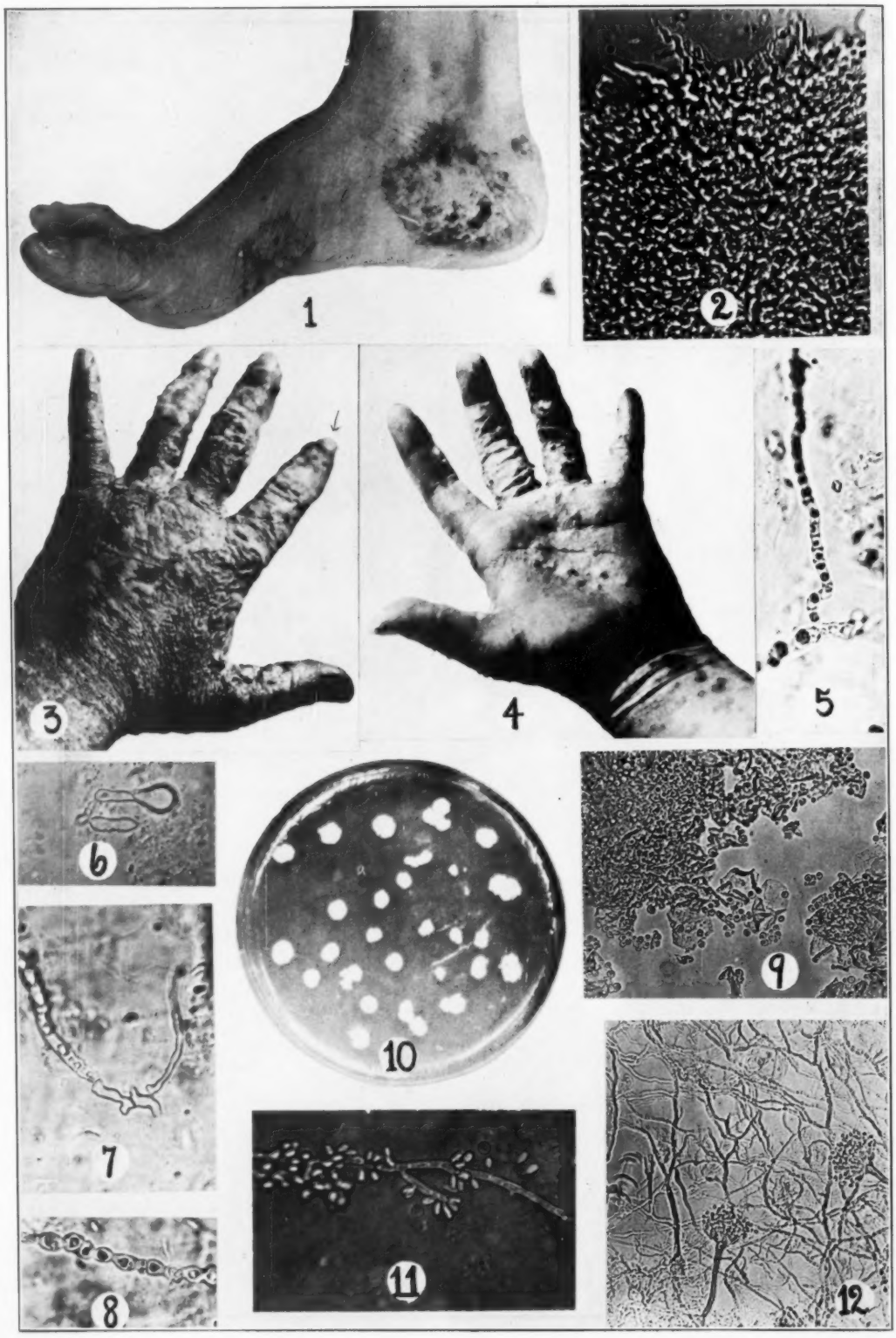
For practical purposes, I have classified these groups as regards their demonstrated cultural differences, as shown by their selected habitat as parasites. Microsporons seem to be limited to the superficial layers of the non-hairy surfaces of the body, and they usually produce small spores. Trichophytons invade the deeper layers of the epidermis, the hairs, and nails, and they usually have larger spores than microsporons. Epidermophytons favor the semi-moist epithelial folds of the body, in the crural and axillary regions, for instance.

Upon the hands and feet the triphophytons produce by far the greater number of infections (Plate I. Figs. 7, 8, 9, 10, 11, 12, 13, and Plate II, Figs. 1, 2, 3, 4, 5, 7 and 8). I have found only an occasional instance of small spored fungus (microsporon) producing white patches of softening of the nails with a very superficial exfoliative lesion of the epithelium of the feet. (Plate I. Figs. 5 and 6, and Plate II. Fig. 9).

From a therapeutic or a diagnostic standpoint, it usually suffices to demonstrate the presence of a definite ringworm fungus in the epithelial layers of lesions that may be present there or in adjacent appendages.

Demonstration of fungi that are growing within thick hornified modified epithelium with a high fat or wax content presents quite a problem to the laboratory technician. Portions of apparently diseased nails or scrapings from lesions may be removed and digested with hydroxide solutions, whereby epithelial structures are either removed or rendered transparent and the fungi which are protected by thick walls are left visible when properly viewed through the microscope. This process requires hours of time, and when carried on upon a microscope slide under a cover-glass results in only a very imperfect digestion of the edges of masses when they are of any appreciable size whatsoever. The digestion of large pieces of nails and tissue removals may better be carried out en masse in a test tube where the solution has free access to all portions of such removals and where the digesting fluid is in sufficient quantity to effect complete digestion of the quantity of tissue to be disintegrated.

In all such digestion residues certain fatty bodies are frequently found (Plate II. Fig. 6) which requires considerable technical skill to differentiate, particularly from spores of fungi. These fat bodies may be easily removed by extraction with ether, which also completes the disintegration of such clumps of epithelial cells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as may not be completely dissolved. Finally, by means of the centrifuge we may *concentrate* and *average* all of such removals to the extent that a single microscopic preparation represents the entire fungus content of all material entering into the process. Digestion by this means further liberates the mycelial filaments with all of the ramifications of its network of intricate branchings to present a picture far more easily recognizable than if such vine-like masses are broken up into short segments of individual spores in small fragments scraped from the nails. The technic may be thus summarized:

1. Cut or scrape as much epithelium from apparently diseased areas as possible. Areas of apparent disease or abnormality of the finger or toe nails are removed with a sharp knife.

2. Place fragments in a small round-bottomed test tube (12 x 115 mm.) and cover with several volumes of 10 per cent sodium or potassium hydroxide.

3. Allow to digest (preferably at body temperature) for 12 to 18 hours.

4. Add 2 volumes of ether. Stopper tube with finger and shake thoroughly.

5. Balance tube and centrifuge in electric machine (equipped with Cornell shields) at 1500-2000 r.p.m. for several minutes. Detritus which contains the spores and mycelia of fungi will collect *between* the two layers.

6. Carefully decant the ether from above the plug of detritus; and allow most of the hydroxide to flow out from under this plug as it floats above the heavy liquid when the tube is slowly tipped to one side.

7. Fill tube with water. Shake and recentrifugalize. The fungi, dirt particles and a few remaining epithelial cells pack in the bottom of the tube.

8. Decant the supernatant fluid. Transfer the sediment to a slide by means of a capillary pipette having a large lumen and equipped with a rubber bulb. Add a cover glass and examine with the 16 m.m. (low) and 4 m.m. (high-dry) lens after properly adjusting the light (Plate II. Figs. 7 and 8).

Aspergillosis. I have encountered only one apparently primary infection with this fungus (Plate II. Fig. 12). A centrally located collection of pus resting between the nail of the thumb and the nail bed was found. The pus contained innumerable mycelia with conidiophores and spores developing in situ. The patient stated that the nail had been removed twice before in the treatment of similar infections.

Sporotrichosis. Infections with fungi of this genus are not uncommon, the primary site of infection usually occurring upon the hand. This produces a chronic suppurative lesion with discharging sinus, and is soon followed by other lesions of the forearm along the course of the lymphatic drainage. Direct microscopic examination of the pus is usually futile, showing only such secondary contaminators as the staphylococcus group. Curettings of the base of the abscess for mycelia is rather difficult. Cultures made in glucose agar plates which are incubated for several days

PLATE II.

Figs. 1 and 2—Trichophyton infection of toe nail and foot with the fungi demonstrated by microscopic examination.

Figs. 3 and 4—Parasitic eczema of the dorsum of one hand, with pompholyx-like lesions of the palm and typical ringworm-like lesions on the wrist, associated with marked lesions of the finger and toe nails.

Fig. 5—Trichophytons recovered from lesions on wrist of hand shown in Fig. 4. Similar fungi were demonstrated in removals from the finger and toe nails.

Fig. 6—Fatty bodies frequently found in simple hydroxide digests of finger or toe nails. Note absence of endospores. Photographed with high dry (4 m.m.) lens.

Fig. 7 and 8—Terminal and middle portion of a trichophyton filament to show the definite endospores present and extending almost to the very tip of the filament. Photographed with high dry (4 m.m.) lens.

Fig. 9—Microsporons. Short mycelial filaments and small spores. Photographed with high dry (4 m.m.) lens.

Fig. 10—Culture of a drop of pus from a previously unopened lesion of sporotrichosis on glucose agar, incubated for 7 days.

Fig. 11—Sporotrichium filament and spores from culture shown in Fig. 10. Photographed with high dry (4 m.m.) lens.

Fig. 12—Mycelial filaments and fructifications as digested free from an exudate occurring under finger nail. Photographed with high dry (4 m.m.) lens.

or a week show numerous characteristic colonies of the fungus (Plate II. Fig 10) which is easily identified by microscopic examination (Plate II. Fig. 11). The colonies are at first white, soon turning a light brown in color.

SUMMARY.

Fungus infections, particularly with the two members of the ringworm group, trichophytons and microsporons, are quite common in semi-tropical climates.

The reservoir from which recurrent trichophyton infections of the epithelium of the hands and feet is in the nails.

Determination of the presence of trichophyton or microsporon infection of the nails is best made by digestion of visibly diseased tissue en masse with 10 per cent sodium hydroxide, extracted with ether and this digest concentrated by means of the centrifuge.

In the diagnosis of all chronic infections of the hands or feet, fungus infections should be considered, with the various laboratory methods of diagnosis pursued that have been found most suitable to demonstrate the type of higher bacteria or fungi indicated by a consideration of the physical characteristics of the lesions presenting.

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DISCUSSION.

Dr. M. T. Van Studdiford: Dr. Johns has very beautifully shown us a procedure for demonstrating and identifying the fungi of the nails. It is gratifying to know we have such a simple process, because we can now demonstrate to our own satisfaction, and that of the patients, the presence of these fungi and less doubt remains in the patient's mind.

Drs. Sabouraud and Segueira have long contended that the failure of treatment of the feet was the re-infection from the nails. Dr. Johns has very well demonstrated that the infection can be produced in the nails experimentally and shown also that the reverse was far more easily accomplished.

One cannot be dogmatic about any treatment for any one condition; however in fungi infection of the nails of the fingers or toes one can say that treatment is most unsatisfactory. Dealing with a disease which inhibits every bathroom floor, golf dressing room, gymnasium mat, it would be hard to inhibit re-infection. In the Mississippi Valley where this disease is so very prevalent and resistant, I would say any lotion or ointment containing acid salicylic and acid benzoic applied at proper intervals would keep the upper hand of the infection, but only permanent removal of the nails or source of re-infection would complete a cure. Roentgen-rays or radium have little, if any, effect on the fungi and cannot be used for removing the nails. The slippers, old shoes and socks are a constant media for reinfecting their wearer. A trip to some cold climate will give the quickest temporary relief for the acute conditions.

Dr. F. M. Johns (closing): There is one point I wish to emphasize with reference to diagnosing actinomycotic infections. They occur always in chronic pus producing lesions. In looking for actinomycosis, always look for granules which are big enough to see with the naked eye. I have on a number of occasions had pus sent to me in suspected cases of actinomycosis and spent hours looking for the organism without being able to definitely arrive at a diagnosis. The laboratory man should see these cases himself. Sometimes the lesion must be incised.

With regard to treatment of trichophytosis, I believe it is perfectly possible to treat and cure these infections of the nails by scraping them out clean, or cutting them out. They cannot be successfully treated with medicine alone. I think the skin specialist would do well to collaborate with the chiropodist. I have submerged sections of infected nails in pure carbolic acid, taken them out, washed off the acid, and then made cultures which grew. In other words, these nails are so filled with growth that it is impossible, from the standpoint of using medicines alone, to eradicate the disease. It must be done mechanically. Almost any of the exfoliative agents may be used to cure the infection in the epithelium.

THE PLACE OF ETHYLENE-OXYGEN ANESTHESIA IN GENERAL SURGERY.*

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NEW ORLEANS.

Ethylene anesthesia has been in more or less constant use since March, 1923, when Arno B. Luckhardt first introduced it to the medical profession, yet its true place as a general anesthetic is still unsettled. That is well evidenced by the paper of Edwin Stanton, Annals of Surgery, Vol. 86, pages 273-279, August, 1927, and abstracted in the International Surgical Digest of October, 1927, pages 199-200. The author sent out a questionnaire to prominent North American surgeons and 640 answers were received. Eighty-five per cent of the 640 surgeons used ether as the standard anesthetic; only ten per cent used ethylene, and the large number of these combined it with ether. On the other hand, some surgeons were extremely enthusiastic after three years' usage. They reported no accidents nor other untoward happenings, although ethylene uncombined was used for all of their operations requiring general anesthesia.

At the Mayo Clinic in the year ending January 1, 1927, 21,260 anesthetics were given. Of these ether was used in 9,228.

In 6,734 ethylene was used in combination with ether or some other anesthetic.

In 2,677 nitrous oxide was used.

In 4,076 ether was used alone.

In 598 ethylene and oxygen were used alone.

In 56 nitrous oxide and oxygen were used alone.

In the year ending January 1, 1928, at the same institution, 21,773 anesthetics were given. Of these ether was used in 10,007.

In 7,300 ethylene was used in combination with ether or some other anesthetic.

In 7,143 nitrous oxide was used.

In 4,387 ether was used alone.

In 118 ethylene and oxygen were used alone.

In 59 nitrous oxide and oxygen were used alone.

If we accept these statistics as standard for the large hospitals of the United States there are several deductions to be drawn:

1. Ether is the outstanding anesthetic of choice.

2. In 50 per cent or more of all anesthesias ether or some combination with ether is selected.

3. Ethylene in combination with ether, carbon dioxide, local or nitrous oxide is used in 33 per cent of the cases.

4. Nitrous oxide in combination has increased from 12 per cent in 1926 to 19 per cent in 1927.

5. The addition of a gas in anesthetic combination has increased from 44 per cent in 1926 to 54 per cent in 1927.

On the other hand, ethylene and oxygen without other supplments decreased from 598 in 1926 to 118 in 1927. In more striking figures, only .0054 per cent of all the anesthetics at the Mayo Clinic during the year ending January 1, 1928, were ethylene and oxygen uncombined. In most of the smaller hospitals the percentage of ethylene used is far less than this, while in some, as well as most of the hospitals of South America and Europe, ethylene as an anesthetic is not used at all.

The fear of an explosion has kept many surgeons from using ethylene in the past and has kept us constantly on our guard. Although the high humidity and other at-

*Read before the Orleans Parish Medical Society, October 22, 1928.

*Report of 1,500 cases with this anesthesia uncombined.

mospheric conditions common to New Orleans and other places similarly situated, bordering a great stream of water and near the Gulf, have protected us from the static electricity by dissipating the force without forming an actual spark, nevertheless we exercise the greatest care at all times to prevent the possibility of explosions. We do not adopt the extreme measures as laid out by the Presbyterian Hospital of Chicago, for, in our climate and location, with large, well-ventilated operating rooms and high ceilings, it is unnecessary.

Shortly after its discovery and first experimentation ethylene was admittedly the anesthetic of choice for bad surgical risks, for the anemic, the weak, the septic, the toxic, for goitre cases, lung cases when a local anesthetic could not be used, and I repeat, for those cases labelled "bad surgical risks." It was selected here because the induction was short and easy, the anesthetic pleasant to take, non-irritating to the lungs, causing no shock, no appreciable change to the heart, blood pressure, nor circulation, and even after long anesthesia affecting very little or not at all the metabolic processes of the body, and permitting of a rapid return to consciousness and normalcy. The ethylene sleep did not differ in appearance from normal sleep. If for these reasons it was chosen for bad surgical risks, why should it not be the anesthetic of preference for all surgery, provided the few minor objections could be overcome?

We have now used ethylene and oxygen without supplements for anesthesia in general surgery over 1,500 times. The following table includes cases operated on at Hotel Dieu of New Orleans from October 1, 1925, to April 15, 1928, a total of 1,402.

October 1, 1925, *to April* 15, 1928:

Brain	3
Amputations	3
Appendectomies without drainage	317
Appendectomies with drainage	85
Caesarean sections	5
Cholecystectomies	31
Cholecystostomies	19
Colostomies and resections	20
Herniae and hydroceles	53
Kidney cases	14
Laminectomy	1
Laparotomies (upper abdomen)	26
Laparotomies (pelvic)	103
Lap and plastics	167
Mammary cases	22
Plastics (uterus and pelvic floor)	293
Rectal cases	50
Suprapubic cystostomies	3
Thyroidectomies	31
Thoracic cases	19
Miscellaneous minor operations lacerated wounds, skin grafts, etc.)	100
Long bones	15
Infections	22
Total	1,402

The cases just tabulated were operated on prior to April 15, 1918. The smooth postoperative course, comparative freedom from nausea, vomiting, gas pains and other distressing complications, the most gratifying anesthetic results, prompted the report in this paper. Anticipating such, the last 100 cases operated on prior to October 15, 1928, were carefully observed and notations made, making a total of 1,502 cases from which conclusions have been drawn.

I shall first make general deductions drawn from three years' experience with ethylene and oxygen, and later attempt more concrete expressions furnished by a careful study of the last 100 cases operated upon.

From a surgeon's viewpoint the primary considerations for a good anesthetic should be:

1. Safety should be the paramount consideration.
   (a) The immediate safety.
   (b) Freedom from complications.
2. Ease and rapidity of induction. It should be pleasant to take and produce sleep quietly and quickly.

3. Satisfactory surgical anesthesia should be possible for all operations.
4. The patient should recover promptly and easily from the anesthetic and show little post-anesthetic distress.

SAFETY.

(a) Immediate safety: Let me quote from the article of F. Webb Griffith, in Anesthesia and Analgesia (August, 1927), page 202: "The occasional anesthetist is just as dangerous as the occasional operator." With a capable anesthetist ethylene is a very safe anesthetic, otherwise it is very dangerous. We have had no fatalities from the anesthetic, although we have had two respiratory failures which were fairly easily resuscitated, one of them breathing very promptly after about two minutes artificial respiration; the other one, however, was resuscitated only after exhaustive measures for ten minutes.

The concentration of ethylene that we use is rarely more than eighty-five per cent, and usually nearer seventy-five or eighty. Many operations have been completed with as small a percentage as sixty or sixty-five of ethylene, the balance oxygen.

Respiratory embarrassment or failure is usually the result of overdosage, over-concentration, and as a rule can be quickly corrected by the anesthetist. I do not believe it is any more likely to occur with ethylene anesthesia than with ether anesthesia. Dr. Isabella Herb, in Anesthesia and Analgesia (December, 1927), page 260, remarks: "Death from ethylene is due to asphyxia and is not due to a central paralysis caused by a poisonous overdose as is the case with ether and chloroform."

(b) Freedom from complications: Later complications of ethylene likely to produce death are practically nil. The drug is rapidly eliminated, and in a very short time, usually a few hours, no apparent traces of the anesthetic remain. Although there is no evidence from other sources to bear us out it is our opinion that existing kidney diseases associated with hypertension is often aggravated, and an acute nephritis will follow the administration of ethylene.

A most striking case was Mrs. O., operation 8/27/26, umbilical hernia. Blood pressure: systolic 178, diastolic 110; urinalysis negative before operation. After operation on the first day a trace of albumin appeared in the urine, and on each following day 5 per cent, 10 per cent and 18 per cent respectively appeared. The patient recovered after a stormy convalescence. There were several other cases showing a similar though milder reaction.

Likewise, an existing pulmonary infection is sometimes intensified by the anesthetic.

Ethylene sleep is so like the natural sleep that there are few or no visible changes in the patient. The color, expression, breathing and general appearance remain the same. There is no harsh breathing, no excessive secretion of mucus in the respiratory tract, nor profuse perspiration. On awakening there is little or no nausea, and seldom any post-anesthetic discomfort or distress. Rarely is there an indication for measures of relief.

EASE AND RAPIDITY OF INDUCTION.

It is extremely rare, and I might say never do patients complain of the odor of ethylene gas, and some of them really like it. There is no struggling, no stage of excitement, no forcibly holding the patient on the table, and sleep is induced usually in two or three minutes.

SATISFACTORY SURGICAL ANESTHESIA.

The surgical stage follows rapidly that of induction although some cases require ten to twelve minutes before an operation can be carried on. Satisfactory surgical anesthesia can be obtained in nearly every case if the surgeon will co-operate with the anesthetist. It very often happens that relaxation is not sufficient, but by simply waiting a few minutes to permit a greater depth of anesthesia, perfect relaxation will

follow. In most instances it is unnecessary to increase the percentage of ethylene used.

Let me stress what I would label ethylene technic. R. J. Pickard, of San Diego, in Anesthesia and Analgesia (February, 1927), wrote: "The difficulties and the inconveniences are rather for the anesthetist and the operator." If a surgeon expects and insists upon the same degree of relaxation that he has with ether, he will probably be disappointed. The surgeon should have confidence in and cooperate to the fullest extent with the anesthetist. He should not expect the same continuous even depth of anesthesia that ether gives, nor is it necessary for all kinds of work, nor for all stages in the same operation. Relaxation almost equal to that of ether can be generally secured, provided the operator is willing to wait for it. Do not crowd the anesthetic nor force the anesthetist to give too great a concentration of the gas. Eighty-five per cent is the maximum that we employ.

Not infrequently during the course of an operation the patient will offer resistance to every surgical procedure. By momentarily stopping the operation and continuing the anesthetic at the same concentration, complete relaxation will soon be established. There were very few of our cases where the operation lasted longer than one-half hour that the patient did not offer resistance at some time or other during the operation, and work had to be suspended until relaxation was again secured. This, however, was only a question of a few seconds. In ethylene anesthesia the border line between wakefulness and sleep is so close that one should rather expect this sub-conscious response of the patient at brief intervals than have no reflex expression whatever to surgical trauma.

Avoid the extreme Trendellenberg position, for this is likely to cause respiratory embarrassment. Do not forcibly or rapidly pack off the bowels, for just such a simple procedure may temporarily cause breathing to stop. In one of our cases, the patient was in a very pronounced Trendellenberg position. At every attempt to pack the bowel off from the pelvic cavity she would stop breathing, and the procedure had to be discontinued. Finally the table was lowered to a more moderate position, the packing was less vigorous, and with little or no difficulty the operation was completed.

PROMPT RECOVERY.

Recovery from the anesthetic is usually very prompt. The patient often awakens before leaving the operating room and is able to talk intelligently to those present. Patients usually vomit once or twice just after reflexes return and before full consciousness is established. There is often no vomiting after this one time.

The usual objections to ethylene anesthesia are smell, explosiveness, freezing and cost. Concerning the odor, we do not admit this as objectionable but find many patients who prefer this to any other anesthetic. The explosiveness is well recognized but can be just as easily met. There is little or no greater danger of explosion here than when you use ether anesthesia or nitrous oxide with ether. Freezing can be well taken care of by the anesthetist. Cost: with a careful and competent anesthetist, the actual gas consumption should not be more than $4.50 to $5.00 per hour at the maximum. This of course does not include the wear and tear of the machine, nor the services of the anesthetist. Our ward patients usually pay $15.00 to $20.00 for ethylene anesthesia.

Let us now observe more closely the last 100 operations with ethylene and oxygen anesthesia, ending October 15, 1928:

Bed No.	Before Operation: Operation	Urine	B. P.	Coag. Time	Urine 1st day 2d 3d	After Operation: B. P.	Coag. Time	Nausea Vomiting	Gas	Misc.
108	Rt. Inguinal Herniotomy	Neg.	120/75	4:00	Neg.	120/75	3:00	None	Sl.	Acute Bronch.
355	Appendectomy	Neg.	115/70	3:00	Neg. Acet. 1 +	115/70	3:00	None	None	Retent. Ur. 3d.
369	Pelvic Laparotomy	Neg.	115/70	3:15	Acet. 2 +	125/70	2:55	None	Sl.	None
360	Pelvic Laparotomy	Neg.	110/75	2:45	Acet. 4 +	125/80	3:00	None	Sl.	None
102	Appendectomy	Neg.	130/90	3:30	Tr. Alb. Casts	133/90	3:00	None	None	Retent. Urine
306	Appendectomy	Neg.	118/80	3:15	Acet. 2 +	125/80	2:45	None	None	None
305	Plastic	Neg.	123/85	2:50	Acet. 2 +	125/85	2:30	None	None	Retent. Urine
360	D. and C.	Tr. Alb.	110/80	2:45	Alb. 1%	115/85	3:00	None	None	None
370	Plastic	Neg.	115/75	3:45	Acet. 2 +	120/75	3:00	None	None	None
145	Appendectomy	Neg.	120/90	3:30	Acet. 3 +	120/90	2:45	None	Sl.	None
390	Plastic and Laparotomy	Tr. Alb.	128/85	3:15	Tr. Alb.	128/85	2:20	Sl.	None	None
106	Appendectomy	Neg.	124/78	3:45	Acet. 1 +	125/78	3:30	Sl.	Sl.	None
110	Appendectomy	Neg.	115/75	3:00	Acet. 1 +	120/70	2:00	None	Sl.	None
314	Empyema	Neg.	145/95	3:30	Neg.	142/100	3:15	V.	Sl.	None
135	Osteotomy	Neg.	140/100	4:00	Neg.	130/100	2:20	None	None	None
124	Hemorrhoidectomy	Neg.	160/100	3:30	Neg.	155/100	3:15	None	None	None
391	Pelvic Laparotomy	Neg.	120/85	3:30	Tr. Alb.	125/85	3:30	None	None	None
214	Plastic	Neg.	130/80	3:45	Acet. 2 +	135/85	3:30	None	None	None
278	Laparotomy and Plastic	Neg.	160/110	3:15	Heavy Tr. Alb. Casts.	145/100	3:30	V. 2	Sl.	None
206	Arthrotomy Semi—L. C.	Neg.	125/95	3:45	Acet. 2 + Acet. 1 +	120/90	3:30	None	None	None
124	Appendectomy	Tr. Alb.	115/90	4:00	Acet. 1 +	110/80	3:30	V. 3	None	None
395	Plastic	Neg.	115/85	3:30	Neg.	125/90	3:30	None	None	None
377	Plastic	Neg.	130/90	3:45	Alb. 1%	135/100	3:30	None	None	

	Before Operation				After Operation					
Bed No.	Operation	Urine	B. P.	Coag. Time	Urine 1st day 2d 3d	B. P.	Coag. Time	Nausea Vomiting	Gas	Misc.
124	Expl. Lap. Appendectomy	Neg.	120/80	3:15	Neg.	130/80	3:15	None	None	None
133	Herniotomy	Neg.	115/65	3:30	Acet. 1 +	115/70	3:30	None	None	None
140	Appendectomy	Neg.	130/70	3:00	Hy. and fine gran. casts Tr. Acet. and Alb.	135/80	2:45	N. and V.	Much	Acute Nephr.
326	Pelvic Laparotomy	Neg.	165/105	2:30	None	135/100	2:45	None	None	None
360	Pelvic Laparotomy	Neg.	125/90	3:00	Acet. 4 +	125/85	3:00	None	None	None
365	Pelvic Laparotomy	Neg.	120/70	6:00	Neg.	125/75	4:30	None	None	None
331	Plastic	Neg.	125/90	2:45	Neg.	120/90	2:30	None	None	None
380	Plastic	Neg.	140/95	4:00	Tr. Alb.	130/90	3:30	None	None	None
368	Pelvic Laparotomy	Neg.	110/85	3:00	Sl. Tr. Sugar	115/85	2:45	Sl.	None	Hiccough
130	Expl. Lap. Up. Abd.	Neg.	125/85	3:15	Sl. Tr. Alb. Tr. Acet.	120/85	3:15	None	Sl.	None
127	Appendectomy	Neg.	130/85	3:00	Neg.	130/80	3:30	None	Sl.	None
357	Pelvic Laparotomy	Neg.	110/80	2:00	Neg.	122/70	2:00	V. 4	None	None
102	Expl. Lap. Appendectomy	Acet. 2	120/95	4:00	Acet. 2 +	118/90	4:00	None	None	None
229	Cholecystectomy	Neg.	130/90	2:45	Acet. 1 +	140/90	2:30	None	Sl.	None
228	Pelvic	Neg.	110/75	3:30	Acet. 1 +	115/75	2:45	V. 1	Sl.	None
381	Pelvic Laparotomy	Neg.	105/55	3:30	Neg.	103/55	3:15	None	Sl.	None
277	Fractured Patella	Neg.	130/90	2:50	Acet. 2 +	140/110	4:10	V. 1	Sl.	None
129	Appendectomy Acute	Neg.	110/75	4:30	Acet. 2 +	130/75	4:15	None	None	None
257	Hysterectomy	Not 1% Alb.	155/110	3:45	Tr. Alb. Tr. Acet.	145/105	4:00	None	Sl.	None
352	Pelvic Laparotomy	Neg.	120/80	3:00	Neg.	125/80	3:00	None	Sl.	None
261	Pelvic Laparotomy	Neg.	130/80	3:15	Acet. 3 + 1 + 1 +	120/80	2:30	None	Sl.	None
145	Expl. Lap. Up. Abd.	Neg.	120/90	3:30	Acet. 1 +	120/90	2:45	None	Sl.	None

135	Expl. Lap. Appendectomy	Neg.	125/80	3:00	Acet. 1 + Neg. Neg.	125/80	2:30	None	Sl.	None
107	Appendectomy	Neg.	125/85	3:10	Acet. 3 +	130/90	2:50	V. 2	Sl.	Acute Bronch.
114	Appendectomy	Neg.	125/85	3:00	Acet. 2 + Tr. Alb.	115/80	3:00	V. 2	Sl.	None
258	Extra-uterine pregnancy	None	75/45	3:45	Tr. Alb.	Too low to record	3:55	Sl. N. 3d.	4 days	Sl. headache
365	Plastic	Trace Acet.	115/68	3:45	Neg.	120/80	3:10	None	None	None
366	Plastic and Laparotomy	Neg.	140/75	2:50	Neg.	144/75	2:40	None	None	None
132	Expl. Up. Abd. Appendectomy	Neg.	120/55	2:50	Acet. 2+ Neg. Neg.	110/75	2:30	None	Sl.	None
133	Herniotomy	Neg.	105/70	2:40	Acet. 3+ Neg. Neg.	110/74	2:45	None	Sl.	Hematemesis
215	Extra-uterine Pregnancy	Neg.	120/78	2:45	Acet. 1+ Neg. Neg.	120/65	2:45	None	Sl.	None
369	Pelvic Laparotomy	Neg.	120/75	3:30	Neg.	120/55	3:15	Sl. N. No. V.	Sl.	None
278	Pelvic Laparotomy	Neg.	105/78	2:50	Neg.	110/75	3:00	V. ld.	Sl. ld.	None
130	Appendectomy	Neg.	115/75	2:30	Acet. 1+ Acet. 1+ Neg.	108/65	2:20	V. twice	Sl. ld.	None
204	Cholecystectomy	Neg.	140/80	3:45	Occasional casts	98/80	2:50	V. 3 1st. d.	Sl.	None
227	Appendectomy	Neg.	110/75	2:45	Neg.	115/75	2:45	V. 3 1st. d.	Sl.	Retention urine 3d.
303	Pelvic Laparotomy	Neg.	120/70	3:35	Tr. Alb. Acet. 3 +	128/75	3:00	Sl.	Sl.	None
372	Plastic and Laparotomy	Tr. Alb.	135/90	3:15	Alb. 2% Acet. 1 +	135/85	3:00	None	None	None
127	Appendectomy	Neg.	115/75	3:50	Neg.	116/75	3:30	None	None	None
267	Plastic	Neg.	140/88	3:15	Acet. 2 + Tr. Alb.	125/85	3:00	None	None	None
390	Pelvic Laparotomy	Neg.	102/55	3:40	Tr. Alb.	100/55	2:50	Sl.	Much distention	None
210	Appendectomy	Neg.	118/75	3:45	Neg.	120/75	3:10	None	Sl.	None
392B	Plastic	Neg.	140/110	3:00	Neg.	135/110	3:00	None	None	None

	Before Operation				After Operation					
Bed No.	Operation	Urine	B. P.	Coag. Time	Urine 1st day 2d 3d	B. P.	Coag. Time	Nausea Vomiting	Gas	Misc.
206	Plastic and Appendectomy	Neg.	125/90	3:45	Tr. Alb.	130/92	3:15	None	None	None
353	Pelvic Laparotomy	Neg.	145/100	3:45	Acet. 2 + Alb.	135/100	3:30	Sl. 2	Sl.	None
218	Appendectomy	Tr. Alb.	155/120	3:30	Alb. 1% Alb. 5.5%	150/110	3:30	Sl.	Sl.	None
316	Laparotomy and Plastic	Neg.	130/95	3:30	Tr. Alb. Alb.	130/90	3:30	Sl.	Sl.	Retent. Ur. 4d
144	Appendectomy	Neg.	135/95	3:15	Acet. 1 +	130/95	3:00	None	None	None
389	Plastic	Neg.	145/95	3:45	Tr. Alb.	150/100	3:00	None	None	None
145	Appendectomy	Neg.	125/85	3:15	Tr. Alb. Tr. Alb.	130/85	2:40	V. 2	Sl.	None
331	Pelvic Laparotomy	Neg.	128/90	2:45	Tr. Acet.	130/95	3:00	None	Sl.	None
302	D. and C.	Neg.	140/85	3:15	Acet. 3 +	133/80	3:00	Very V. 6	None	None
363B	Pelvic Laparotomy	Neg.	130/88	3:10	Acet. 1 +	125/85	3:00	None	None	Retent. Ur. 2d.
231	Herniotomy	Neg.	135/90	3:10	Tr. Alb. Acet.	140/88	3:00	None	None	None
135	Appendectomy	Neg.	125/90	3:15	Tr. Alb. Tr. Acet.	128/90	3:00	None	Sl.	None
390	Appendectomy and Plastic	Neg.	125/100	3:00	Alb. Acet.	135/100	2:45	None	Sl.	Retent. Ur. 3d.
384	Laparotomy and Plastic	Neg.	130/95	3:00	Neg.	130/95	3:00	None	None	Retent. Urine
310	Hemorrhoidectomy	Neg.	130/95	3:30	Alb. Acet. 1 +	130/95	3:00	None	None	None
385	Expl. Lap. Appendectomy	Neg.	110/85	3:00	Neg.	115/85	3:15	None	None	None
116	Appendectomy	Neg.	120/80	3:00	Acet. 1 +	120/85	3:15	None	Sl.	None
103	Bone Graft	Neg.	125/85	3:15	Neg.	135/85	3:00	None	None	None
139	Pelvic Laparotomy	Neg.	125/85	3:00	Tr. Alb. Acet. 4 +	125/90	3:00	None	None	None
364	Cholecystectomy	Neg.	120/85	2:45	Acet. Tr. Alb. Casts.	105/80	2:30	3d.	3d.	None
274	Pelvic Laparotomy	Neg.	120/90	3:00	Acet. 1 +	115/85	3:00	V. 2	Much	None
368	Thyroidectomy	Neg.	185/140	4:00	Acet. 3 +	160/110	3:00	None	Sl.	None

361–B	Pelvic Laparotomy	Tr. Alb.	175/120	3:15	Tr. Alb. Acet.	170/100	3:00	None	Sl.	None
369	Plastic	Neg.	125/95	4:00	Acet. 4 + Tr. Alb.	120/95	3:30	Ld.	None	None
102	Appendectomy	Neg.	130/90	3:30	Acet. 1 +	130/90	3:00	None	None	None
218	Pelvic Laparotomy	Neg.	130/90	3:30	Tr. Acet. Tr. Sug.	135/90	3:00	None	Sl.	None
317	Pelvic Laparotomy	Neg.	110/85	3:15	Neg.	115/90	3:00	None	Sl.	None
478	Laparotomy and Plastic	Neg.	120/95	4:00	Acet. 3 +	110/95	3:45	None	Sl.	Retent. Ur. 7d
471	Plastic and Hemor.	Neg.	125/90	3:30	Acet.	120/90	4:00	None	None	None
370	Cholecystectomy	Neg.	130/80	3:30	Casts Tr. Alb.	125/80	3:30	None	Sl.	None
225	Plastic	Neg.	120/90	3:45	Neg.	125/95	4:00	None	Sl.	None
271	Plastic	Alb. Tr.	120/85	5:15	Acet. 2 + Alb.	130/85	4:45	None	Sl.	None
377	Plastic	Neg.	120/85	3:00	Tr. Acet. Tr. Alb.	120/85	2:45	None	Sl.	None
128	Appendectomy	Neg.	125/90	3:00	Acet. 2 +	135/100	2:30	None	Sl.	Acute Bronch.
124	Appendectomy	Neg.	133/85	3:15	Acet. 1 +	130/85	3:00	Sl.	Sl.	None

1. In tabulating these, 102 general anesthesias were counted, for in two operations a small percentage of ether was added, in one instance, to secure greater relaxation of the abdominal muscles, and in the other to act as a cardiac and respiratory stimulant.

2. There was no anesthetic difficulties. All patients were in surgical sleep within ten minutes. With comparative ease the surgical stage was maintained during the entire operation.

3. Slight nausea and vomiting were generally present immediately after the discontinuance of the anesthetic. Occasionally this lasted several hours. Twenty-seven per cent showed some nausea, although only 2 per cent were sufficiently severe to call for medical aid.

4. One of the series became hysterical after returning from the operating room, and this probably was due to a severe misfortune which had very recently befallen her home, just two days previous.

5. Acetone appeared in the urine of 57 per cent of cases on the first day post-operative. It usually increased on the second and third days, quickly disappearing after giving the patient nourishment.

6. Gas pains and distention caused little discomfort and called for no measures of relief except a hot water bag to the abdomen and rectal tube in all but 6 per cent of the cases. In 55 per cent, however, these were manifest to a very slight degree.

7. Post-operative albuminuria, 1 per cent above, occurred in four cases. In each there was definite evidence of existing or previous kidney disease. Mrs. H., blood pressure 178/110 showed 5 per cent albumin on the fourth day. Mrs. C., acute nephritis three years previous, postoperative albumin 1 per cent, red blood cells and a few casts. The other two cases also gave a history of previous kidney disease. Pre-operative urinalyses in all cases were negative.

8. Coagulation time was definitely shortened in 70 per cent and lengthened in 16 per cent, remaining stationary in 14 per cent. In no instance was the increase sufficient to cause alarm.

9. Vomiting of blood occurred in one case; about one tablespoonful bright red blood was vomited ten hours after a simple herniotomy in a child twelve years old.

10. Blood pressure: It usually rose slightly during the operation but at the conclusion showed little change over the pre-operative blood pressure. In 45 per cent there was a rise of 20 or less. In 20 per cent it remained unchanged. There was very little change in the diastolic blood pressure.

11. Two of our cases were convalescing from influenza and in each instance the cough became worse, the expectoration more profuse and purulent.

Ethylene has no effect on healthy lungs but might easily cause an acute flare up in lungs showing existing mild infection.

12. One of the patients in this series died; that a male, 57 years old, having a gangrenous appendix. He was a very poor surgical risk and only operated on as an emergency. The others made uneventful recoveries.

The thermocautery is used by us in severing an appendix and searing the stump, but only after many precautions are taken. This is the only time the cautery is permitted in our operations. We had one near explosion in 1925 when ethylene vapor beneath the sheets on the operating table ignited. The tanks had previously been turned off, the patient's lungs washed with oxygen, and no ill effects resulted.

What we have said detrimental to ethylene anesthesia applies in great measure to ether and other anesthesias. Many of the favorable criteria pertains to ethylene alone.

In drafting a conclusion let me begin with the opinion of Gwathney: "Ethylene is steadily gaining ground. So far we have not found a gas or anesthesia to replace it." Also Dean Lewis, in Practice of Surgery (1928), Vol. 1, Chapter 3, Anesthesia, page 23: "Ethylene anesthesia produces muscular relaxation almost equal to ether."

CONCLUSIONS.

In our opinion:

1. In the hands of an expert ethylene is as safe as ether.

2. It is the anesthetic of choice for general surgery, good risks as well as bad ones.

3. The normal body functions are less disturbed than with other anesthetics. During the operation and afterwards a condition approaching normalcy prevails.

4. The cost, though above ether, is by no means prohibitive.

5. There are times when a local, spinal, local with ethylene, or rectal anesthesia are to be preferred.

6. Existing pulmonary infection or kidney pathology is sometimes slightly aggravated by the administration of ethylene.

7. Comparing it with the other general anesthetics, the minor objections to ethylene are far outweighed by its immense advantages. The many trying hours, and sometimes days, of gas pains, irritative cough, occasional conjunctivitis, nausea and vomiting are now forgotten, and the anesthetic course is best described in the two questions so often asked by our patients:

At the end of twenty-four hours, "Doctor, what can I eat?" and at the end of forty-eight hours, "When can I go home?"

Note—I am indebted to Miss Agnes Grillet, R.N., senior anesthetist at Hotel Dieu, for giving and supervising the administration of these anesthetics, to Dr. J. LaNasa, for carefully compiling the records of the last 100 cases recorded, and to the nursing staff in the operating room at Hotel Dieu for their assistance in preparing this paper.

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DISCUSSION.

Dr. Ansel M. Caine (New Orleans): I read today with a great deal of pleasure Dr. Nix's most excellent paper. The work of compiling these cases and the records that he has are most complete.

In general I agree with what he says. In order to have the relaxation that is essential for abdominal operations you certainly have to have the 100 per cent co-operation of the surgeon, as well as his forbearance, and he has to realize the importance of this. Ethylene does not give a perfect relaxation like ether. The surgeon who operates under local can operate better under ethylene than one who is used to ether, as he is more gentle. The surgeon who is used to ether and perfect relaxation has a pretty hard time getting along with ethylene unless he is absolutely determined to get along with it and co-operates with the anesthetist. Wait until he tells you to start before making your incision; if you start before you are pretty sure to be displeased with the anesthetic. It takes time to relax the patient and when he starts groaning it takes time to make him stop groaning—you can use all the drugs you know and yet the anesthesia is not complete in a minute.

One thing Dr. Nix did not mention is that we have been using recently carbon dioxide, which helps to deepen the anesthesia. The addition of carbon dioxide, 6 to 8 to 10 p r cent, increases the respiration; where he has been running about 500 c.c. tidal you can run him up to 1000 c.c., and when the air vesicles are thoroughly filled the absorption is greater and the patient gets under the anesthetic quicker. It assists in deepening the anesthesia where the patient is breathing shallow and groaning; they are only breathing about 300 to 200 c.c., and it is largely tracheal breathing; instead of breathing fifteen times a minute they sometimes breathe about six times and everybody is getting nervous for the patient's safety. The addition of carbon dioxide increases respiration promptly and the anesthesia is deepened. I find with the majority of surgeons it is required to add some ether rather frequently in laparotomy although some are perfectly willing to do without perfect relaxation. Occasionally we get perfect relaxation, but it is not constant by any means.

As to the after effects we get, as Dr. Nix says, nearly every patient empties his stomach during recovery. There are exceptions, however, and sometimes they are nauseated for quite a little while afterwards.

Regarding the explosiveness of ethylene, most of the accidents reported are static except those, of course, that are preventable. Here, where it does not get so cold, and is damp, we have no static except on cold, dry days, and they are very, very few, consequently, with the proper precaution, the danger of explosion is negligible.

I have enjoyed listening to, as well as reading, this paper and thank Dr. Nix for his contribution.

Dr. A. C. King (New Orleans): This subject is one of interest to every surgeon and those of us who are growing gray-headed can remember the times we had with chloroform and our experiences in reaching around for the safest anesthetic and the one offering the most comfort to our patients. A most important consideration that should not be overlooked, I think, is to

know the action of the chosen anesthetic on the body.

I ran across a most interesting, instructive article by Dr. John D. Brumbaugh, giving his deductions from an experimental study on the effects of ethylene-oxygen anesthesia on the normal human being. The number of experiments (15) is not great, but sufficient to give us an insight into the effects of this anesthetic on a normal person. I quote it verbatim:

"Subjects.—Fifteen men, eight of whom were graduate physicians, officers of the medical corps, and seven of whom were enlisted men of the medical department, volunteered to be anesthetized for this study. The ages ranged between 21 and 37 years, and all passed a careful physical examination.

"Method.—The anesthesia was given in the morning, without breakfast and without any pre-anesthetic medication." (I would ask Dr. Nix to mention, in closing, what he uses for a pre-anesthetic sedative.) "Before the anesthesia was begun the blood pressure, pulse and respirations were recorded, a specimen of urine was obtained, the hemoglobin was determined, and blood was drawn from the median vein for the determination of the coagulation time, blood sugar, blood urea, carbon dioxide combining power, and the icterus index. The subjects were anesthetized for one hour, at as nearly a constant depth of surgical anesthesia as possible; the induction was started with a mixture of approximately 85 parts of ethylene and 15 parts of oxygen," (I wish to know whether Dr. Nix used ethylene and oxygen in the same proportion?) "and maintained as near this concentration as the patient would permit. Two brands of ethylene gas, both accepted by the Council on Pharmacy and Chemistry of the American Medical Association, were used. During the anesthesia, the pulse, blood pressure and respirations were recorded at five minute intervals. At the termination of anesthesia, the hemoglobin was again determined and another specimen of blood was drawn from the median vein for the determinations mentioned. Twenty-four hours after the anesthesia, the subjects reported without breakfast," (this is very important) "the hemoglobin was determined, a specimen of urine obtained and a specimen of blood again withdrawn from the median vein. The recovery time and all post-anesthetic morbidity were carefully recorded."

CONCLUSIONS.

"From the study of fifteen normal subjects under ethylene-oxygen anesthesia for one hour, without any pre-anesthetic medication, and without operative or other complicating factors, we feel justified in drawing the following conclusions:

"1. The induction sensation of a subject undergoing ethylene-oxygen anesthesia is pleasant; the odor of the gas is not a disturbing factor either during induction or following recovery.

"2. There is no change in the hemoglobin, as shown by the Newcomer hemoglobinometer, either immediately following, or twenty-four hours after anesthesia.

"3. There is no change in the icterus index, either immediately following twenty-four hours after anesthesia, and there is no appreciable destruction of red blood cells, with the resultant liberation and destruction of hemoglobin, and no appreciable derangement of the biliary system, following this anesthesia.

"4. There is a marked increase in the blood sugar immediately following anesthesia, the average being 45.3 per cent with a fall to practically the pre-anesthetic level in the subsequent twenty-four hours.

"5. There is no change in the blood urea immediately following anesthesia, but there is a definite increase in the blood urea twenty-four hours after the anesthesia, which in this series averaged 18.7 per cent.

"6. There is a moderate decrease in the carbon dioxide combining power of the blood which is only temporary, and returns to the pre-anesthetic level within twenty-four hours. The average decrease in this series was 8.35 per cent over the pre-anesthetic level.

"7. There is no change in the coagulation time of the blood, either immediately following or twenty-four hours after this anesthesia.

"8. There is no change in the character of the blood clot either immediately after or twenty-four hours following this anesthesia.

"9. There are no urinary changes following this anesthesia.

"10. There is an increase in the systolic blood pressure, which in this series amounted to 14.1 per cent, and a slight increase in the diastolic blood pressure, which in this series amounted to 3.5 per cent, and an appreciable increase in the pulse pressure, which in this series averaged 31.4 per cent during this anesthesia.

"11. There is no appreciable increase in the pulse rate during this anesthesia.

"12. The postanesthesia morbidity in this series was much greater than is usually encoun-

tered in patients undergoing operative procedures."

Dr. J. A. Danna (New Orleans): I agree with most of the nice things Dr. Nix has said about ethylene, but I am afraid the impression would be given, from what has been said so far, that ethylene is not dangerous. I believe the reason that the Mayo Clinic does not use as large a proportion of ethylene or as freely as they did is because they have found it dangerous. They discovered that under prolonged ethylene anesthesia their patients did not do as well as under ether anesthesia. This thing struck home to me at just about the same time that they came to this conclusion. I had been having deaths following prolonged anesthesia with ethylene that I could not understand and it was not until Dr. Sistrunk of the Mayo Clinic called my attention to his own feeling about the matter that I came home and stopped using ethylene whenever anesthesia was required for over three-fourths of an hour or an hour. I am sure that I lost four or five patients because I used ethylene. Has anyone here had a pure, clear-cut ethylene anesthesia death? (For answer see Dr. Jerome Landry's discussion.) I had one, and had it before I knew that it was possible, in giving ethylene, to get a sample or package of ethylene that might contain carbon monoxide. My patient died of carbon monoxide poisoning, without my knowing it, right under my eyes. This happened over two years ago.

Dr. Nix says his patients relax very easily. My patients do not relax very easily with ethylene; unless they receive a good-sized dose of morphine beforehand, it is very hard to get them strictly muscularly relaxed with ethylene.

One of the ways in which patients do badly under ethylene, especially in warm weather, is that they get post-operative high temperature which looks very much like heat-stroke. I had quite a number of these cases until I realized that ethylene was the basic cause.

Dr. Jerome E. Landry (New Orleans): About ninety per cent of my charity work is done under local anesthesia, while in a little over ninety per cent of my private work I use ethylene. I have had three ethylene deaths. I was called in to assist one of my confreres who was trying to do a herniotomy under local and had been working for an hour upon it. He found that he could not reduce the contents of the hernial sac and I suggested ethylene. So Miss Grilette, our anesthetist, started to give the ethylene anesthetic: about three minutes after the patient was dead. The two other cases were at Charity Hospital; five minutes after the ethylene gas anesthetic was started they were dead. However, I still believe that ethylene gas is the safest of all anesthetics used today.

Dr. E. L. King (New Orleans): I have found ethylene very useful in obstetrical work, particularly in normal deliveries or low forceps deliveries, and do not hesitate to give it in those cases for a matter of two or three or four hours, intermittently of course, only administering it during uterine contractions and not giving it in between. It has also proved useful in other obstetrical operations, those that we do not perform under local, such as the high classical Cesarian or the low operation. I have had similar gratifying experiences with a few cases of ectopic pregnancy, but I will agree with others that we do not always get the absolute relaxation that is desirable. However, in most cases of ectopic pregnancy this is not as essential as in upper abdominal work.

The objection has been raised that ethylene predisposes to post-partal hemorrhage. This has not been my experience, for I have noticed no increased or excessive bleeding following its use.

Ethylene does not give sufficient relaxation for the average case of version. Really we need ether, or, as Dr. Lewis contends, it is best done under chloroform. Potter of Buffalo, one of our most expert obstetricians, also claims that there is nothing like chloroform in these cases and that not even ether gives the relaxation necessary for version. So with ethylene, naturally, we would find that the relaxation would hardly be sufficient.

Dr. H. L. Kearney (New Orleans): I just want to say a few words about the use of ethylene from the standpoint of the throat man, that is, the use of this anesthetic agent for tonsillectomy and adenoidectomy, for instance.

In throat work the production of anesthesia is difficult because the mouth is open and the patient does not get gas in the lung. Many tonsillectomies have been done under gas anesthesia (ethylene) by the use of a tube introduced into the lower part of the pharynx, but anesthetization is difficult because, as aforementioned, the patient does not get a sufficient quantity of the anesthetic into the lung for relaxation on account of the open mouth.

Dr. Baker has given for me several ethylene anesthetics for tonsillectomies in which we used the intratracheal tube, first anesthetizing the patient with ether, then switching to the tube and continuing the operation under ethylene. This is very much more satisfactory than the other method, using only ethylene, for then the patient is never sufficiently relaxed. Relaxation

with ethylene, in any way it is given, to me is not as complete as with ether; the patient's tongue is apt to be swollen and in the way, and the relaxation is never as satisfactory as with ether.

For the intratracheal tube we use a large catheter; through the tube we have cut into the sides, holes corresponding to Jackson bronchoscope. This gives the gas a chance to escape and facilitates the anesthetic.

For many cases I think ethylene is ideal; in throat work it might be particularly indicated in those cases where there is some suspicion about the kidney function. We have used it in these cases, first obtaining relaxation with ether, then introducing the intratracheal tube and continuing with ethylene.

Dr. Urban Maes (New Orleans): The discussion of this paper has, it seems to be, put the surgeons somewhat on the defensive. I am quite ready to agree with the anesthetists that the surgeons should co-operate with them, but I would suggest, in return, that co-operation on the part of the anesthetists is equally desirable. When I am operating and the anesthetist tells me the patient is ready for me to proceed, I take his word for it, and if the patient strains, I feel that he has quite as much to do with it as I have.

My own experience is that ethylene is not the ideal anesthetic for upper abdominal work. In selected cases, especially where other types of anesthesia are contra-indicated, it has a definite field, but generally its advantages are more than overbalanced by the imperfect relaxation and the consequent additional manipulations necessary to keep the intestines in place. The more the viscera are handled, the more trauma is caused, and the patient's condition is worse in the end than it would have been under ether anesthesia. Many times I have been very much embarassed, at the close of an operation, when I was not even handling the viscera, because the patient forced out his intestines and I could not put in my sutures, and for this reason, if for no other, I am opposed to the routine use of ethylene for upper abdominal surgery.

Dr. H. W. Kostmayer (New Orleans): I certainly agree with Dr. Maes about the trauma to the tissues more than counterbalancing any good derived from the use of ethylene as an anesthetic when working in the upper abdomen. I think this is even more true of pelvic work than it is of work in the upper abdomen. My personal experience with ethylene is that it costs more, there is the ever present possibility of blowing out the patient's trachea, it makes the operating room smell like a sugar house and does not give sufficient relaxation. If I learned tomorrow that its manufactured had been stopped, I would not be disappointed.

Dr. Jas. T. Nix (closing): I thank Dr. Caine for his kind discussion, also the other discussors of my paper. I had anticipated a difference of opinions and knew, more or less, what the arguments would be.

The very latest thing off the press I can quote is by Dean Lewis, who says: "Ethylene gives you almost the same degree of relaxation that you get with ether." I started the use of ethylene could give it.

Concerning the pre-anesthetic drug, I give 1/6 gr. of morphine and 1/150 gr. of atropine as a rule, varying the amount according to the condition of the patient.

With reference to Dr. Danna's remarks, I do not think that ethylene has fallen into disfavor at the Mayo Clinics; I should say rather that the reverse obtained, for last year they gave 7000 ethylene and ether anesthetics and in 1926 the number given was 6000. It would seem therefore that Dr. Danna is wrong. Regarding the explosiveness of this anesthetic agent, the above figures certainly indicate that they are pretty well able to handle the situation from this viewpoint.

Regarding the relaxation, there is no question about it; in some cases we do have to use ether. The percentage of ether we used was very small and it was only given during that part of the operation where there is straining. We very seldom had to resort to this measure.

I think that the time factor plays an important part; if the patient is on the operating table a long time it is usually more dangerous than in a short operation. I have never seen any deaths from ethylene anesthesia. As stated in my paper, I have had two respiratory failures, one very evanescent, the other lasted ten minutes. In one case I had two years ago, the patient had undergone a very serious operation. He did not die at that time, but five days later. Dr. Jamison, who was called in consultation called it alkalosis; he did not call it an anesthetic death then, therefore I am not counting it as an anesthetic death at this time. I am sure we have given nearly 2000 ethylene anesthetics up to the present. Two days ago a patient who was given anesthesia caused us some embarassment on the table. After hypodermic medication, however, his breathing was better, and during the operation he was further stimulated. The operation (upper abdomen) lasted three-quarters of an hour and was completed successfully. One-half ounce of ether was given during the course of operation; probably 20 minutes after the operation was begun.

Again I thank you, gentlemen, for the discussions, pro and con.

THE DISEASED GALL BLADDER.*

CARROLL W. ALLEN, M. D.,

NEW ORLEANS.

The gall bladder occupies much the same position in the medical thought of today as that occupied by the appendix twenty-five years ago. This stormy petrel of the abdominal cavity was often the subject of more than half of the discussions at our medical meetings of that time. The Murphy drip and Ochsner method of treatment had their origin at that time, as we slowly emerged from a period of doubt and obscurity to one of certainty and assurance, when today we can almost lay down dogmatic rules for the handling of their little trouble-maker.

We are still far from accurate in our diagnosis of diseases of the upper abdomen and the best method of handling the pathology of these parts is still the subject of much debate and divergent opinions.

As the results of investigation in the experimental, pathological, chemical and radiological laboratories in callaboration with clinical observation our knowledge of the physiology and pathology of the gall bladder is slowly evolving out of this chaos until now we are individually, if not collectively, able to formulate some definite rules for our guidance in dealing with disease if this organ based on well established data.

Certain physiological facts regarding the gall bladder and biliary system would seem now as the result of repeated observation to be fairly well recognized.

1. It is a functioning and not a vestigial organ.

2. During the intervals of digestion it concentrates bile by absorption of the watery element, which concentrate is again diluted and delivered into the intestine during the next period of digestion.

3. The nervous control of the gall bladder and biliary system is the same as in all reservoirs of the body. A relaxation of the sphincters is automatically followed by a contraction of the musculature of the reservoir, and the reverse holds true; a contraction of the sphincter at the ampulla of Vater is followed by a relaxation of dilatation of the gall bladder. The rectum and urinary bladder are two other illustrations of this universal rule.

4. Following the removal of the gall bladder nature again prepares a reservoir for the accumulation of bile by a dilatation of the common duct.

Considerable pathological data have gradually been accumulated and can be stated with a fair degree of certainty.

1. The gall bladder is rarely ever a primary focus of infection. It is fairly well agreed that the infection travels by the portal vein to the liver, and from here is conveyed to the gall bladder, most probably by the lymphatics. It is common after typhoid and I am confident that influenza is a cause of infection probably through the blood. Dental and oral foci are also stated as being capable of producing gall bladder infection.

2. The gall bladder once infected may be the source for continued reinfection of the liver, and a chronic hepatitis be established.

3. The relationship between an infected gall bladder and glycosuria is now thoroughly proven by the infection travelling along the duct of Wirsung from the ampulla of Vater. This infection in the pancrease, when once well established, may lead to a chronic fibrosis of the entire organ with a destruction of the Islands of Langahan resulting in a true diabetes. Dr. Allan Eustis, with whom I have been working on this subject for some years, is firmly of the opinion that the diseased gall bladder is a potential source of diabetes.

*Read before St. Tammany Parish Medical Society, Slidell, November 14, 1928.

4. The infection may be conveyed from the gall bladder by the circulation and result in an arthritis or myocarditis (brown atrophy of the heart muscle)—or an arteriosclerosis.

Dr. Eustis in a careful analysis of 100 cases of myocardial insufficiency shows that the chronic gall bladder was responsible in 38 per cent.

5. Imperfect liver metabolism brought about by biliary infection may result in the absorption of more or less toxic substances resulting in a variety of disturbances.

A major advance in the study of gall bladder disease was begun with the introduction of methods of vizualizing the gall bladder as developed by Graham, Cole, and others. This method is not only of value in recognizing the diseased gall bladder by its failure to contract and properly empty when viewed in the cholecystogram, but is also of tremendous clinical importance in evaluating the results obtained by the various methods of treatment, namely, medical alone, or combined with transduodenal lavage and simple surgical drainage.

The normal gall bladder should take up the dye readily in from eight to twelve hours and show as a clearly outlined figure in the roentgenogram, and contracts practically to the point of disappearance following a fatty meal. The failure of the gall bladder to vizualize is evidence of a marked degree of disease of its walls and vessels which renders it incapable of taking up the dye. The pathological gall bladder, when visualized, may either fail to contract or contract imperfectly when viewed by the cholecystogram indicating its inability to properly empty itself which is taken as a guide of its degree of pathology.

As a result of this means of observation we are able to determine the benefits resulting from the various methods of drainage.

In a small number of cases complete relief of clinical symptoms is accomplished over considerable periods of time and lesser relief in a large number, with negative results in the large majority.

As a result of these studies with the cholecystogram it is shown that but a very limited amount of benefit of transient duration is obtained by any method of drainage and forces us to the conclusion that it is futile to expect the diseased gall bladder to regain its normal function by these measures which may only result in serious organic change which endangers the life of these patients and that these means of treatment should be reserved for that class of patients where the radical method of treatment is too hazardous and palliation is all that should be attempted.

In my own patients where surgical drainage has been all that was possible at the time of operation, nearly all have returned in from one to two years for cholecystectomy.

There is at present much difference of opinion as to the best method of administering the dye—some advocates of the intravenous route insist that this is the only dependable means of administration.

At the Baptist Hospital we almost invariably use the per orem method of administration, and in my own cases, I have kept a close check on results and have rarely found a single instance where the operative findings were at all at variance with the cholecystogram.

With these physiological, pathological and clinical data we must conclude that the diseased gall bladder is better "out" than "in".

The same rules which guide us in the handling of the acute appendix can not be accepted as criteria in the diseased gall bladder.

Unlike the acute appendix, the acute gall bladder is better left alone and rarely ever does it present an emergency at all com-

parable to the acute appendix and unless attended by very serious symptoms, or gangrene is feared, it is better to palliate the condition and operate in ten days or two weeks when its removal may be quite easily undertaken. If operated in the acute stage, drainage is all that should be attempted and is often quite difficult and hazardous and is frequently attended with infection of the wound and slow healing. These cases if allowed to "cool off" may often have their gall bladders safely and easily removed unless complicating conditions forbid.

I invariably do a cholecystectomy in all uncomplicated cases, and reserve drainage for all cases of secondary pancreatitis, chronic hepatitis, jaundice, cases weakened by long continued sepsis. In cases of stone in the common duct associated with jaundice the gall bladder should always be drained and often the common duct too after the stone is removed, occasionally one finds a case of stone in the common duct with the duct embedded in a mass of adhesions, matting it to all surrounding parts, the patients jaundiced and septic. Any attempt at digging out the stone under these conditions is far too hazardous and should not be attempted, it is far better in such cases to drain the gall bladder and await the subsidence of the pathology, and go in a second time.

Prolonged jaundice greatly increases the risk of operation as these cases frequently bleed freely from all traumatized surfaces and are prone to develop liver and kidney complications.

While the clotting time of the blood is always a good guide in these cases, it is not always dependable. Blood transfusion as a pre-operative procedure is often very helpful, or the intravenous injection of 5 to 10 c. c. of a 10 per cent calcium chloride solution may be used to advantage.

We have during recent years heard much of cholecysto-enterostomy and similar procedures. I have not, however, been able to consider this procedure with any favor and if we accept the view of the majority of surgeons that the diseased gall bladder should be removed there is then no place for cholecysto-enterostomy except as a means of side-tracking the biliary stream in cases of loss or occlusion of the common duct.

In the chronic gall bladder case the appendix is nearly always involved and I have found this so frequently that I consider the chronic appendix as one of the causes of gall bladder disease and invariably remove it at the time of the cholecystectomy.

In a thorough study of the pathology of the upper abdomen the stomach should be carefully gone over. In the typical gall bladder case hypochlorhydria is the more common finding while with the simple chronic appendix hyperchlorhydria is usually found.

The appearance of the gall bladder at operation is often taken as a guide to its pathology and in the hands of the experienced this may be reliable particularly so if the gall bladder empties freely under moderate compression. We, however, occasionally meet a smooth thin-walled gall bladder where the duct is sufficiently diseased to produce interference in its evacuation. The rule should be when in doubt remove it, particularly so if the clinical symptoms would seem to indicate disturbed function.

There are few fields in surgery which call for more judgment and experience then the complicated gall bladder. Our chief guide should always be the conservation of life and to accomplish this end in the complicated case one must often be content with incomplete work and be willing to leave behind some pathology to be relieved at a later and more favorable time.

PERSONAL EXPERIENCES IN ABDOMINAL SURGERY EMERGENCIES.*

ISIDORE COHN, M. D.,†

NEW ORLEANS.

Many are inclined to think only of traumatic lesions when the subject "Surgical Emergencies" is mentioned.

It is proposed here to discuss abdominal emergencies under four headings.

(1) Spontaneous.

(2) Traumatic.

(3) Operative.

(4) Post-operative.

In class (1), the so-called spontaneous surgical emergencies, will briefly discuss acute appendicitis, perforating gastric and duodenal ulcers, gastric hemorrhage, due to intrinic and extrinic causes; hemorrhage, whether subcutaneous or from one of the mucous membranes, particularly those associated with splenomegaly and acute gangrenous cholecystitis.

In class (2), traumatic, rupture of solid viscera, particularly the spleen, and hemorrhage.

In class (3), operative emergencies, or such conditions arising from unintentional injury to the common duct during a cholecystectomy, injury of the intestines during an abdominal incision, hemorrhage during abdominal operations, and sliding hernias.

In class (4), post-operative, intestinal obstruction, alkalosis, post-operative hemorrhage, and post-operative rupture of the abdominal wall.

This paper was prompted by some of the following experiences.

A young physician was lamenting the fact that a patient could not be operated on by the house officer and said: "If I had a pain in my belly I would want the first surgeon around to operate on me." An older surgeon replied: "I would rather wait a little until an experienced man could arrive. His judgment would in most instances justify the delay."

Another inexperienced doctor operating on a patient found a perforating gastric ulcer. The doctor removed the appendix, put in a drain and remarked: "If I knew how to do one of those things," meaning a gastroenterostomy, "I would do it."

It should be remarked, parenthetically, that this patient recovered.

A great surgeon speaking to a hopeful young man, said: "It is fortunate that you have not a large surgical practice yet because you could not handle it." Little did the young man realize the truth implied, "what would you do with it?"

That is precisely the question under discussion—what would you do with it.

All abdominal emergencies call for experience, knowledge of literature, conviction, and prompt action.

When one considers the subject of abdominal surgical emergencies it is necessary to mention first that subject about which most has been written—appendicitis.

Zachary Cope has only recently said: "If the mortality from appendicitis is to be reduced almost to the vanishing point it is essential that the early signs and symptoms of the condition should be appreciated."

It is interesting to contrast that statement with the expression of Murat Willis (1926): "The mortality from appendicitis has increased 31 per cent during a period from 1905 to 1922. In 1921 the mortality was 14.4 per 100,000 population. There are about 16,000 deaths annually in the United States from appendicitis."

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"The annual toll taken by appendicitis almost equals the combined total of intestinal obstruction, gall stones, and gastric and duodenal ulcers. Before the age of 45 more persons die annually from appendicitis than cancer."

The contrast between the Utopian idea of Cope and the statistical findings of Willis must make one realize that the ideal status of knowledge and skill has not been reached.

Probably one reason is that given by Hendon in the following quotation: "The only hand that paints a perfect picture of pathology is the hand of death, and the only critic that applauds the pathological art is the grave."

One reason why so many are lost is that some wait for the perfect picture. Some depend too largely on the blood count. It cannot be emphasized too much that delay may mean death, and that the complete clinical picture is not necessary.

Proper interpretation of signs and symptoms will lead to better results.

We believe that too much stress is placed on operation and not enough on diagnosis. There are many skillful operators who are not equally skilled in diagnosis.

One way to reduce mortality is to make early accurate diagnosis and operate at once. To compromise on delay, because of family prejudice to operation, may mean your reputation and the patient's death.

One cannot expect each case to present the classic picture.

Some of the worst cases are those where the patient walks into the office. It may not be difficult for the surgeon to diagnose the condition, but the fact that the patient has a sense of well being and has considered his illness a trivial matter makes it difficult to convince him of the urgency of an operative procedure.

Such cases may be illustrated by the following experiences:

Case 1. Mr. L. L. (1914), walked into the office and gave the history that he had had abdominal pain for about 48 hours. During the past few hours his pain had been relieved.

Examination revealed marked rigidity on the right side and a large mass. Palpation did not cause the patient pain.

Immediate operation revealed a ruptured gangrenous appendix from which the patient eventually succumbed.

Case 2. Mr. J. L., age 40 (1927). Patient complained of epigastric distress; as the patient described it, "same feeling as it is when stomach is out of order."

During the preceding day he had taken a purgative, since which time his pain increased. No nausea nor vomiting had been associated with his pain. His bowels had acted. Temperature, 99°.

Abdominal examination revealed no tenderness above the umbilicus. Slight increased defensive attitude of the muscles on the right side below the umbilicus. The leukocyte count was 13,750 with a differential count of 68 per cent neutrophils, 27 per cent large mononucleated, and 5 per cent small mononucleated.

This patient was advised that he had an acute appendicitis and that he should be operated on. He demurred; in fact, stated that he was not sick enough to be operated on. After 48 hours he consented to go to the hospital.

At operation we found a gangrenous appendix. The convalescence was stormy as it was accompanied by a severe bronchopneumonia.

Case 3. Mr. G. L. (1927), walked into office complaining of pain which had persisted for 24 hours. His bowels had acted. He had been able to work and at no time had his appetite been impaired.

On physical examination there was pain on pressure on the right side of the abdomen, slight increased resistance of the right rectus muscle, and slight elevation of temperature.

He was operated on in the afternoon of the same day and a gangrenous appendix was found. Recovery was uneventful.

Case 4. Miss M. S. (1921), complained of pain for four days, nausea, but not vomiting. Temperature 99°, pulse 90. The leukocyte count was 12,000, of which 83 per cent were neutrophils.

The patient refused an immediate operation. Against advice she went to the hospital in an automobile.

At operation, which was performed immediately after admission, we found a gangrenous appendix and a large quantity of cloudy fluid in the abdominal cavity. Her convalescence was uneventful.

Case 5. Mrs. B. P. (1927), was examined because of an epigastric pain, for which she had been under treatment by another physician for several months. She had had heaviness after eating, not associated with eructations. Temperature 99 3/5°. Blood count showed 10,000 leukocytes, 80 per cent of which were neutrophils.

Abdominal examination revealed right rectus rigidity and hyperesthesia of the right side below umbilicus. Pressure over the umbilicus was accompanied by pain in the right lower quadrant of the abdomen.

Operation in this case was not considered urgent. The patient was operated on the following morning. At this time we found a large quantity of free peritoneal fluid. The appendix was thick and its vessels were markedly injected.

The fact that a patient is examined in the office, and even feels well enough to attend to his work should not deter the surgeon from feeling, if the clinical manifestations justify it, that an actual emergency exists, and the patient should have the possible danger which he is facing clearly outlined to him, thus placing the entire responsibility on him.

Frequently the history may be misleading, particularly is that true in cases where the patient insists that he has committed a dietary indiscretion. Diarrhea associated with abdominal pain does not necessarily mean that appendicitis is not the cause.

This can be illustrated by the following case:

Case 1. Mr. T. B. (1927,) complained of pain in the abdomen for about 24 hours. During the preceding night he had drunk a large quantity of home-made wine. His pain was not constant and he had had frequent stools. His temperature when first seen was normal, pulse 78. Two hours later the temperature was 100°, pulse 90.

The doctor who first saw him did not consider it of sufficient importance to make a blood count. The patient was seen two hours later by the author. The blood count was 18,200 leukocytes, 78 per cent neutrophils. There was some tenderness in the lower quadrant.

At operation, five hours later, we found an appendix covered by a fibrinous exudate. The lumen was constricted about one inch from the tip.

When the diagnosis is questionable, delay for a few hours during which time the patient can be kept under observation and repeated blod counts made is justifiable.

Case 1. Mr. S. L., age 18 years (1926). I was called to see him the night of September 27th, 1926. He had had pain in the abdomen during the entire day; the pain was diffuse, later localizing in the upper segment of the abdomen. There was no urinary frequency. He vomited once about 7 p. m. His temperature was 97 4/5°. He was apparently perfectly comfortable. There was abdominal tenderness, but no rigidity on either side of the abdomen. The only area where I found tenderness at all was the right hypochondrium. His pulse was 72. Blood count showed 14,700 leukocytes, with 80 per cent neutrophils. Prior to getting the report I advised the mother that I could not definitely make a diagnosis of appendicitis (at that time), but in view of the fact that he had had previous similar attacks I felt that we should make further observations, and if within 12 hours he still had pain we would advise operation.

The following morning it was reported that he had had a comfortable night, no nausea nor vomiting, the bowels moved by enema, the temperature was normal and his pulse was 84. I found slight tenderness in the right iliac fossa. I advised operation.

We found an acute inflamed appendix which was stuffed and its walls were tense and friable. In places discoloration of the walls suggested beginning gangrene.

Relief from pain is sometimes taken by the patient to indicate that he is improving where as in reality relief may be an indication of gangrene, and therefore be evidence for an emergency operation.

Case 1. Mr. E. M., age 22 years (1927). History—Pain in the lower abdomen for 24 hours. He took a purgative after which his pain was worse. When admitted to hospital he felt fine. The abdomen was rigid, particularly in the lower segment; the blood count was 19,500 leukocytes, 87 per cent neutrophils.

At operation we found a gangrenous appendix.

Certain cases particularly when viewed in the light of results make one question

whether operation should be performed in some cases.

Case 1. Mrs. H. A. F., age 47 years (1923). Present illness began about four weeks before with an attack of pain in the lower right abdomen. No nausea nor vomiting. Pain remained constant.

On examination there was a mass palpable in the lower right quadrant of the abdomen.

Clinical diagnosis: acute appendicitis, probably with abscess.

At operation we found a large quantity of free peritoneal fluid. The appendix was closely adherent to the posterior cecal wall. After the appendix was removed the cavity from which it had been taken was enlarged and a large quantity of thick purulent material evaculated.

Five days after operation the patient complained of great pain in the left leg and thigh. Examination revealed marked redness and swelling of the leg, evidence of a thrombo-phlebitis.

Three days later temperature rose to 104°. There were rales at the base of the right lung and the patient succumbed from pneumonia which, I believe, was due to a septi infarct.

Case 2. Mr. S., age 45 years (1924). History—Pain for about 2 days during which period he was confined to bed. He was first seen on the days of the operation.

Examination revealed abdominal pain, tenderness, distention and rigidity. Blood count 26,000 leukocytes, 73 per cent neutrophiles.

Immediate operation was done, at which time a large quantity of free pus was found. A fibrinous exudate was seen on the coils of the small intestine. The appendix was seen in the fossa between the cecum and ilium and removed.

Six days after the operation he developed an acute dilatation of the stomach, toxic nephritis, and death ensued.

In cases of this kind Wilkie's statement is particularly pertinent: "In late cases in reasonably good condition is one justified in interpreting the natural process of cure which by that time is well established? To operate on all cases at once is to allow reason to be overruled by prejudice."

Since some of these cases are in rèality peritonitis one might add, to what Wilki has said, the notable comment of George E. Armstrong: "The operating surgeon only needs courage, not the courage of heroic activities, but courage to stay his hands."

It is easy enough to philosophize about these cases in the light of their end-results, but no hard and fast rule can be made and judgment alone in the individual cases must be our guide.

If we knew before hand much which we find out afterwards, it is easy to see how much better doctors we would be. Our best will be better if we analyze our own results, and try to profit by the experience of others.

Enough has been said about the appendix. Most of us feel, I believe, that early diagnosis and early operation will avoid many of the sad sequences of delay.

Another type of acute abdominal condition is acute gall bladder disease. The question as to whether these are emergencies or not is still being discussed and variously answered by some of the greatest masters dealing with the subject.

This may be illustrated by quoting from a recent paper by Bruggeman, read before the Western Surgical Association, December, 1927:

"Acute cholecystitis may be compared to acute salpingitis in that it rarely kills if treated conservatively. Surgical writers are prone to compare it to acute appendicitis, but this comparison is not in consonance with the clinical facts. Acute cholecystitis does not cause widespread peritonitis unless a perforation occurs early."

"Operation is indicated in any case when the diagnosis is questionable, or if a perforation is suspected. The greatest danger in this conservative treatment is the possibility of mistaken diagnosis."

"I feel that I have ample support in my position that operation is very seldom indicated. It is my conviction that as a rule operation should be avoided until the signs of active inflammation have disappeared."

Bruggeman quotes Walton, Leriche, Cotte, Kirscher and many other foreign surgeons who advocate cholecystectomy in acute cholecystitis; on the other hand, Haggard, Deaver, Bunts, Lyons, Judd, Richardson, George Muller, Archibald and many other American surgeons are opposed to operation in the acute stages.

Most of them are of the opinion that only the urgent cases should be drained. We have not considered acute cholecystitis as a condition warranting emergency operation.

In these cases where an empyema of the gall bladder or gangrene is associated, drainage operations are done. The friability of the gall bladder, the possible difficulty incident to ligation under these conditions and the fact that the gall-bladder is usually well walled off seems to justify this policy.

Case 1. Mr. C. L., age 24 years (1927). History—Two days ago he was siezed with severe pain in the upper right abdomen. The pain has been constant and severe. There was a prodromal malaise for a few days before the attack. Nausea was noted.

P. H. A year and one-half ago he was jaundiced for several weeks. Preceding the jaundice he had had pain in the upper quadrant of the abdomen, but not nearly so severe. Again about three weeks ago he had pain, not very severe. During the attack his stools were pale, the urine was dark brown and the perspiration stained his garments.

Abdomen: Marked rigidity of the upper right quadrant with considerable pain and tenderness in this region. There is slight rigidity in the lower right quadrant and very slight tenderness. We were unable to palpate the liver and spleen.

Leukocyte count 22,000, 87 per cent neutrophils.

Operation: Right rectus incision, its middle corresponding to the umbilicus, so that we could enlarge above and below as the case may be. There were no flakes of fibrin on the cecum. The appendix was small, almost of the obliterative type. There was a band covered by pericolic membrane. It was easily seen at a glance, that the appendix was not responsible for any of the man's present trouble. The hand introduced into the upper abdomen revealed a gall bladder which was about five inches long and its greater diameter about two and a half inches. It was thick walled, tense and stood out against the surrounding collapsed organs as the evident cause of the disease.

The incision was prolonged upwards, the walls of the gall bladder were seen to be pale gray, very thick, and friable.

A cholecystostomy was done, and the abdomen closed. The appendix was not removed. He made an uneventful recovery.

Three months later a cholecystectomy was performed.

Case 2. Mrs. M. B. W. (1921). History—Pain in the back for six days which increased in severity. The pain radiated to the right breast. In spite of her pain she continued to work.

She had never had digestive disturbances of any kind.

Four days after the onset, the pain began to localize in the upper right quadrant of the abdomen. Two grains of codein failed to relieve her pain. The physician in attendance introduced 20 per cent magnesium sulphate solution through a Jutte tube for the purpose of draining the duodenal contents and the gall bladder. She vomited the tube, after which the severity of the pain increased so that ½ grain of morphin had to be given.

The following day her temperature was 102°, pulse 108. The blood count at the time of her admission to the hospital showed 26,000 leukocytes.

Abdominal examination: Marked tenderness and pain in the upper right quadrant localized over the gall bladder. The examination otherwise was unimportant.

Diagnosis of acute cholecystitis with probable empyema of the gall bladder was made.

At operation we found a quantity of clear serious fluid. The small intestine was covered by a fibrinous exudate. The tip of the gall bladder was black. A rubber dam strip was applied over the gauze packs so if there was any spilling we would limit it to a certain extent. The incision was made in the gall bladder and about 6 ounces of thick bile was aspirated. The walls of the gall bladder were possibly 1/16 of an inch thick and when the finger was introduced into the abdominal wound, we were able to feel a large stone in the lower portion of the gall bladder, possibly obstructing the cystic duct. The stone was removed from the gall bladder after which a Pezzar catheter was introduced into the opening. The appendix was seen to be small and gave no evidence of disease and for that reason, no attempt

was made to remove it, believing that the prolongation of the operation under these conditions might possibly be disastrous.

Summary: This operation was done seven years ago. Our findings were acute gangrenous cholecystitis, cystic duct obstruction as well as general peritoneal reaction.

Reference to the operative record will show that there was a fibrinous exudate over the entire small intestine, the fundus of the gall bladder was discolored, the walls were thick.

The pain which she experienced was evidently due to the blocking of the cystic duct by a large stone. A cholecystostomy was done.

No effort was made to do a cholecystectomy as we believed that such an operation would probably have resulted fatally.

Jaundice is at times an indication for emergency procedure such as cholecystostomy in gall bladder disease.

Case Mr. H. J. F., age 35 years (Nov., 1927). Two weeks ago patient became jaundiced. The stools were, at times, normal in color, at other times grey. No pain had been experienced in the abdomen at any time. He had been nauseated and at times complained of an epigastric fullness.

Examination of the patient revealed a deep jaundice, patient extremely toxic and weak. The abdomen was distended, but no marked tenderness except in the right hypochondrium.

The Van den Bergh direct showed strong reaction. The leukocyte count was 9,000, 80 per cent neuthrophils. Bleeding time was 2 minutes.

The roentgen-ray diagnosis was perforating duodenal ulcer.

He was seen by me first on November 23, 1927. Operation was done November 25, 1927; operation consisted of cholecystostomy.

This was done because of the marked toxemia and in the hope that the biliary drainage might relieve the jaundice and the toxemia incident to it.

The patient improved readily, his jaundice gradually cleared up, and 3 weeks after the operation the patient was allowed to go home.

Cholecystectomy was done February 25, 1928. At this time the patient was no longer jaundiced and the drainage from the gall bladder was only a clear mucus. The stools had normal color and we therefore felt that cholecystectomy was justifiable.

At operation we found a great many adhesions. We found the omentum adherent along the whole upper portion of the retracted peritoneal leaf.

These dense adhesions were cut through after clamping and the omentum transfixed and dropped back. The gall bladder was adherent to the peritoneum by a large omental fold. This was cut through and transfixed. The gall bladder was large and thick walled. There were no stones palpable, but there was a gland just at the cystic duct which was probably three-quarters of an inch in length and half an inch in the transverse axis. (The largest gland I have ever seen along the cystic duct.)

There were apparently no stones in the common duct, which was patulous and soft. The head of the pancreas was not hard—there was no evidence of an ulcer of the stomach or duodenum. The adhesions between the gall bladder and the omentum had produced a constriction of the duodenum and this in turn had caused a dilatation of the first portion of the duodenum.

As soon as these adhesions had been cut through, the duodenum filled out below. The gall bladder was removed then in retrograde fashion and the fossa peritonealized.

It should be noted that on the under surface of the liver, just beyond the gall bladder fossa, there was a small circumscribed, elevated nodule which was of a deeper color than the remaining portion of the liver. This presented a firm consistency.

For fear of getting into uncontrollable bleeding, I did not excise this mass which appeared to be inflammatory, rather than a malignant mass.

The abdomen was closed, without the use of a drain.

This patient has gained in weight, has had no recurrence of his jaundice, and has been able to return to his work.

Comments: This patient was markedly jaundiced, emaciated, and it was impossible to arrive at a definite diagnosis in spite of the fact that all of the laboratory tests, including Van den Bergh's, both direct and indirect, were utilized.

The pre-operative diagnosis was cholecystitis, cholangitis. The possibility of a carcinoma of the ampulla of Vater had to be considered.

The roentgen-ray diagnosis was perforating duodenal ulcer.

At operation as will be noted by the first operative record, as well as at the second, found no evidence of a malignancy.

The first operation consisted of a simple cholecystostomy, at the second a cholecystectomy was done.

SUMMARY

1. In gall bladder cases emergency operations are comparatively rare.

2. In acute cholecystitis if there is evidence pointing to perforation, empyema or gangrene, operation is an emergency procedure.

3. Cholecystectomy under these conditions may prove disastrous.

4. Cholecystostomy should be done, and at a later date cholecystectomy done with less danger to the patient.

PERFORATION OF GASTRIC AND DUODENAL ULCERS

Perforations of gastric and duodenal ulcers require immediate operative intervention if the patient is to be saved. The results obtained will depend entirely on the accuracy of the diagnosis and the length of time after the perforation occurs that operative intervention is instituted.

It is possible at times to confuse a perforation with an acute appendicitis, but as a rule the diagnosis can be made if the symptoms are properly interpreted.

When perforation of a gastric ulcer occurs in elderly people confusion sometimes exists and a diagnosis of retroperitoneal hernia, or even acute appendicitis, is made. Perforation is not unusual in the fifth and sixth decades.

The symptomatology and clinical findings in perforation present, as a rule, a definite picture.

The roentgen-ray can be of great value because of the finding of a gas bubble between the liver and the dome of the diaphragm which causes elevation of the diaphragm.

The type of operation must depend largely on the condition of the patient and the skill of the operating surgeon. In those cases where it is expedient to do nothing more than close the perforation, if this closure does not interfere with the lumen of the pylorus, this procedure may be all that is necessary and certainly will suffice as a life saving procedure. Other operations may be done at a later stage.

The usual story in perforating ulcers is well illustrated in the following case:

Case 1. Mr. L. S. (1928). History—Abdominal pain began about 10 P. M. when he was attending to his duties as a policeman. The pain was so severe that it was necessary for him to sit down. He had a desire to vomit, but could not.

On admission to Touro Infirmary (11 P. M.), physical examination revealed a well nourished young man who was not particularly pale. but whose face presented an axious expression, indicating an intense pain; pulse 90, good volume. Abdomen was rigid, particularly in the upper segment.

The radiologist was called and requested to make a picture of the abdomen.

The patient was then taken immediately to the operating room. The operation was performed within two hours of the onset of the patient's pain.

A large quantity of fluid which was cloudy and contained many particles of digested food was found.

As soon as packs were introduced, the stomach came easily into view, and immediately over the pylorus we could see an opening through which the gastric contents were spilling into the abdominal caviety.

The stomach was picked up and the discharge of its contents stopped in this way. Packs were introduced and the opening closed, transverse to the axis of the bowels. Two layers of sutures introduced; first row, chromic catgut; second row, fine linen.

The patient's condition was good, except that the anesthetist informed us that he was slightly cyanosed, and for that reason we did not proceed with a gastroenterostomy. His recovery was not marked by anything unusual.

Case 2. Mr. W. G. (May, 1914). Diagnosis: Perforating gastric ulcer. This young man had complained of an abdominal pain for two weeks. Nausea without vomiting had been present during this period. The pain had never been severe enough to cause the patient to go to bed.

He had had a similar attack one year before. In the interval he had had sour eructions following the ingestion of food.

When first seen at 1 P. M. in the office I found no evidence of rigidity but some epigastric pain and some pain to the right and left of the midline. Below the umbilicus there was no pain.

This young man was a medical student and the day of examination antedated the close of school by about two weeks, for that reason I felt it might be possible to delay interference until the close of school.

At 5 P. M. of the same day I was called because the patient had violent abdominal pain localized in the upper portion of the abdomen. He had not vomited. His temperature was 99°, pulse 80. Marked rigidity to the right of the midline above the umbilicus. Pain was so acute that he could not bear the touch of the hand. The patient was immediately transferred to the Presbyterian Hospital where he was operated on.

At operation (2 hours later) we found a large quantity of gastric contents pouring into the field. A perforation was found in the first portion of the duodenum. The edges of the ulcer were very friable and with great difficulty the perforation was closed because sutures did not hold.

Gastroenterostomy was not done.

The patient with the exception of a development of a fecal fistula had no trouble. He left the Hospital two weeks after the operation and 7 weeks after operation the fecal fistula had closed. His weight at this time was 158 pounds.

This operation was performed 14 years ago. The patient was seen about one year ago. At the present time he weighs about 185 pounds. He has had no further trouble.

There are cases which demand subsequent operation where the original operation concisted of closure of the perforation alone.

Secondary operation may demand excision of the ulcer or that combined with gastroenterostomy; or even more radical procedure.

This is illustrated in the case of Mr. P. S.:

February 9, 1922, I was called to see the patient because of intense abdominal pains. The patient was seized with these pains while at work at 4:30 in the afternoon. He immediately went home to bed, the pain being intense. It was more marked in the epigastrium and right iliac fossa. He had not vomited up to the time I saw him. In an attempt to get some relief he sat up in bed. When seen at home I found patient very very pale, sitting in the upright position, and he had the facies of intense pain. Examination: Temperature subnormal 97 4/5°. Pulse 80, good volume, regular. Abdominal examination: All of the muscles contracted. The greatest amount of tenderness was noted in the epigastrium and iliac fossa. There was marked dulness below the umbilicus. Hyperresonance in epigastrium. Taken immediately to the Touro in ambulance where a leukocyte count was made, which was 19,500 with 85 per cent neutrophiles. He was immediately operated upon.

Operation: High right rectus incision. When the peritoneum was opened a large quantity of thick yellowish fluid with air bubbles discharged from the wound immediately. The peritoneum was thickened and examination of the stomach from the cardiac end to the pylorus revealed nothing on the anterior of the body of the stomach. The pylorus was about 1/6 of an inch in diameter. Its walls were thickened and its edges everted. We could see the chyme pouring out of the opening. The opening was closed with chromic gut sutures No 0. *A small quantity of greater omentum was sutured over the opening as a protective covering.*

A gastroenterostomy was not done for two reasons, first, because I did not believe the man's condition justified any further operative procedure, and second because the sutures did not cause sufficient constriction to obtain the pylorus.

This patient required a second operation 8 months later because of recurrence of the symptoms.

At the second operation a gastroenterostomy was done.

Since the second operation, October, 1922, this patient has gained about 50 pounds in weight and he never has digestive disturbances.

Case II. Mr. E. P., age 22 years. (1914) Patient complained of "indigestion" for three weeks. He had abdominal pain on February 15. The patient took a dose of salts and his bowels acted within the hour. The pain persisted and began to localize around the umbilicus. Not being satisfied he took 5 grains of calomel.

On admission to Touro his temperature was 99°, pulse 102. There was pain on pressure all over the abdomen, particularly in the right iliac region, also the epigastrium, with rigidity of both recti.

The leukocyte count was 17,000, 94 per cent neutrophils.

Pre-operative diagnosis: Acute appendicitis.

Operation: A large quantity of sero-purulent material was seen. The appendix was covered with flakes of fibrin. The appendix was removed. *Further exploration, because of the great quantity of fluid, showed a perforation on the anterior wall of the stomach close to the pylorus.* The perforation was closed. Gastroenterostomy was not done.

Patient left the hospital three weeks after operation. A letter received from him April, 1923 stated that he had developed tuberculosis and he had recently been having "stomach trouble."

Comment on Case:

The history of indigestion, the sudden acute diffuse abdominal pain, and the generalized rigidity, without nausea and vomiting, probably should have directed attention to the possibility of perforation. *The fact that the appendix was covered with flakes of fibrin and was itself acutely inflammed shows how easily a case of this kind may have been closed without further search for the cause and the patient probably would have been lost because of the failure to recognize a perforating gastric ulcer.*

Case III. Mr. B., age 63 years (1914). Acute abdominal pain 5 P. M., October 29, epigastric and right iliac in character. Patient vomited.

Examination showed a man past middle age, well nourished and apparently acutely ill. The abdomen was extremely rigid. The greatest pain and rigidity was in the epigastrium. Blood count showed 12,100 leukocytes with 85 per cent neutrophils.

The patient was kept under observation for about 4 hours. Since the symptoms did not abate, the patient was operated upon and we found a perforating gastric ulcer.

A large quantity of stomach contents was seen pouring out of the perforation. The perforation was closed and the omentum sutured over the site of the perforation to act as a buffer.

The convalescence was uneventful and the patient left the hospital 11 days after operation.

When last heard from, about 5 months after operation, he was feeling perfectly well.

Another type of surgical emergency is one in which there is a gastric hemorrhage. A word of caution should be given here against surgical intervention with a view of trying to find the bleeding vessel. Gastric hemorrhage may be associated with esophageal varicosities, and with varicosities in the stomach, or with diffuse hemorrhage from the stomach not particularly because of erosion of a vessel.

Archibald of Montreal has called attention to this and has advised transfusion in preference to gastrotomy.

There are times when gastric hemorrhage is associated with gall bladder and hepatic diseases. In some of these instances drainage of the gall bladder may prove all that is necessary.

This is illustrated in the case of Mrs. E. M.:

Patient, age 39 years (1925). History—Epigastric pain which had become more intense and was of the varying character. Pain was not increased by eating, but was less severe after vomiting. She had vomited blood several times.

On the night of July 20, 1925, she vomited a large quantity of blood.

When admitted to the hospital her pulse was 130, temperature normal. The patient was pale, but did not present a picture of an individual in shock.

Pre-operative diagnosis: Ulcer of the stomach, gastric hemorrhage.

Post-operative diagnosis: Cirrhosis of liver, cholecystitis, cholelithiasis, probable esophageal varices.

Operation: High right rectus incision. Large amount of fat both pro-peritoneal and subperitoneal. When the peritoneum was opened, there was no fluid found. The liver was seen to be very large, rough and presenting a mottled red and gray appearance. The gall bladder was thick walled and of grayish hue and it was distended. The stomach came into view. There were no adhesions about it. Its walls throughout presented the same consistency. No infiltration of the stomach walls either on the lesser or the greater curvature. The pylorus was perfectly free. No evidence of thickening. The first portion of the duodenum presented no abnormality, no infiltration or evidence of ulcer. To make certain that there was no ulcer a gastrotomy was done and a Cameron light introduced. No blood was found in the stomach. The rugae presented nothing abnormal. Sponge introduced into the stomach came away without more than a simple blood stain. The stomach was then closed—3 tiers of chromic catgut used. The gall bladder was palpated and we found two small stones in the

gall bladder. Inspection of the small intestine showed that they were filled with a dark bluish looking material giving the impression that there was blood in the bowel. Hence we had evidence of cholecystitis, hepatitis with stones in the gall-bladder. It was thought expedient to drain the gall bladder and remove these stones. This was done. Chromic catgut used and pezzar catheter introduced, 2 small mulberry stones removed. The bile was thick and almost tar colored. The cystic duct was patent. Pancreas was palpated and no indurations found. Abdomen closed in tier suture. Patient left table in good condition.

While on the subject of hemorrhage one cannot pass without a word regarding those cases in which hemorrhage is part of a disturbance of the reticulo-endothelial system. In a case of purpura hemorrhagica after proper investigation of the laboratory findings, transfusion followed later by splenectomy will give the most spectacular result.

II. Traumatic Emergencies.

In this particular paper we will limit our discussion of traumatic emergencies to rupture of the abdominal viscera.

Rupture of a hollow viscus, excepting the bladder, and that in conjunction with fractures about the pelvis, are uncommon. Rupture of a solid viscus, such as the liver or spleen, are relatively uncommon, but this should not deter us from looking for it following violent injury to the abdominal wall.

It must be remembered in dealing with these, that pain is not a prominent manifestation. The patient does not show evidence of shock until hemorrhage has been severe.

During the first few hours following rupture of a solid viscera an anemia is not evident from the blood picture.

In two cases of rupture of the spleen, which I have seen and operated on, the blood count was respectively 4,565,500-4,950,000; hemoglobin, respectively 65 and 83. Hemorrhage is associated with leukocytosis. These phenomena have been accepted by most of the authorities for many years.

The physical findings, as a rule, when there is a rupture of one of the solid organs, are marked pallor, rapid respiration, low tension pulse, abdominal pain, rigidity of the abdominal muscles, dullness on percussion of the abdomen and fullness in the posterior cul-de-sac on rectal examination.

There are two definite indications in these cases — immediate operation and transfusion.

It is not sufficient for the surgeon to satisfy himself with "internal injuries" and wait for the post-mortem to reveal the facts which may have been obtained at operation, and a life possibly saved.

III. Operative Emergencies.

I think this subject may be discussed under the following headings:

1. The finding at operation of an unexpected condition. This is considered an operative emergency because it demands resourceful and prompt decision.

2. The injury to an important vessel, or hollow viscus.

We might begin by asking the following question: "Did it ever happen to you?"

Did you ever find at operation, when operating for what seemed to be a simple, indirect inguinal hernia, that you were dealing with a sliding hernia?

Have you ever been unfortunate enough to injure the common duct in doing a cholecystectomy?

Has hemorrhage, while doing an appendectomy or cholecystectomy, ever given you concern at the table?

Every surgeon of experience has been forced at times to admit before operation that the diagnosis in some cases has been undetermined and for that reason the expression, exploratory laparotomy, has been coined.

These operations are becoming less frequent as the diagnostic acumen of the operating surgeon and his medical confreres increases. But in spite of all laboratory aids there are times when one will find the unexpected condition at the table.

Such an instance is illustrated in the following cases:

Case 1. Mr. O. S. W., age 68 years. Patient complained of an epigastric pain which had existed for two months. Great loss of weight.

Five weeks before coming under observation he had had an attack of abdominal pain which he was unable to get rid of it. He went to an institution where he was purged daily.

Since admission to Touro Infirmary, on medical service, he had vomited only one time. No eructations.

Examination: Patient very much emaciated. Skin dry. Mucous membranes normal in color. Abdominal findings—Fulness below the umbilicus. Superficial veins well marked. There is a visible peristalsis. In the upper portion of the abdomen no definite mass could be palpated.

The roentgen-ray findings suggested a perforating ulcer. On account of the patient's age, great loss of weight, and icteric tinge of skin, and the filling defect in the colon as well as in the stomach, the clinical findings seemed to indicate the probability of a carcinoma either of the stomach or transverse colon.

At operation we found a subphrenic abscess which had been walled off from the abdominal cavity by plastic exudate which held the stomach firm out against the liver and diaphragm. As soon as the stomach was separated from the liver there was a spilling of some of the contents in the cavity. This necessitated immediately an intercostal drainage of the subphrenic accumulation, also an effort to cofferdam the opening leading into the general cavity.

Another type of operative emergency occurs in connection with gall bladder surgery where, during a cholecystectomy, the common or hepatic duct is injured due to an anomalous angle formed by the two ducts. If one sees a spilling of bile into the cavity, after the ligation of the stump of the cystic duct, careful search should be made for the injury in the hepatic or common duct.

This emergency had best be met by introduction of a tube into the duct or suture.

Such an experience once had will never be forgotten.

In connection with this the following brief summary may be cited:

Case 1. Mrs. K. P. (1916). Operative diagnosis: Empyema of gall bladder, cholelithiasis, cystic duct obstruction.

The gall bladder walls were extremely thick and the walls of the cystic duct were also very thick. After ligature had been placed around the cystic duct and the duct severed between the ligature and the clamp removed we saw that there was a drainage of bile from a lateral wound in the hepatic duct. A small rubber tube was introduced in the hepatic duct. This drained bile freely prior to closure of the abdominal wound.

In citing the above emergency those who have not been unfortunate enough to have such an emergency may be inclined to be a bit critical.

One of the most interesting of all emergencies is that which occurs in the course of apparently a simply indirect inguinal hernia when one finds that instead of a sac there are apparently adhesions everywhere and these "adhesions" when cut bleed very freely.

Some have had the experience of opening what they thought was a sac and found that they were within one of the hollow viscera, particularly the cecum or bladder. An attempt to separate the expected sac from the surrounding tissue is met everywhere by increasing bleed.

I recall being present in the operating-room when a surgeon was in such a dilemma and he was unaware that he was dealing with a sliding hernia. The so-called adhesions were in reality the vascular supply to the cecum and the ascending colon as they wound around the posterior parietal peritoneum from the roots of the mesenteries. He accepted the suggestion that he make a second incision after the plan of Moschowitz. Immediately the difficulty was overcome.

Until the recent work of Mochowitz the difficulties incident to this particular operative emergency were very great. His suggestions of making an incision along the outer border of the rectus muscle, as for an appendectomy, and introduction of a pair of sponge forceps from above to bring the abdominal viscera back into the cavity make it very easy to deal with this particular condition.

Nothing can be more embarrassing than to have a condition of this kind and not know just what to do with it.

In this connection I am reminded of the story of a certain doctor who was operating on a patient with a hernia. Someone asked, "Suppose that the hernia returns, what will you do?" his reply was, "Then the patient can wear a truss."

It is fortunate that there are few such men.

Hemorrhage during the course of any abdominal procedure, whether it be an appendectomy, cholecystectomy, or other condition, can produce a great deal of trouble. Indiscriminate clamping without having a clear field is to be deplored. The introduction of sutures blindly into the depths may do untold harm. A good exposure and an attempt to obtain a clean field will enable one often to see bleeding points. Do not close an abdomen unless you are satisfied that all bleeding is controlled.

Operative emergencies will be few in the hands of the experienced surgeon in proportion as his assistants are trained each to do his particular work and not everybody attempt to be the operating surgeon.

IV. Post-Operative Emergencies.

The post-operative emergencies may be immediate, as those which occur from shock and hemorrhage; those that come on after 24 or 28 hours, such as the acute toxemias following cholecystectomy, and those which occur at a later time such as alkalosis, evidence of an obstruction or an ileus, fecal fistulae, and post-operative eventration.

Many more might be mentioned, but those grave emergencies will supply a sufficiency for this particular reminiscence.

Post-operative shock from hemorrhage fortunately is diminishing and shock from all other causes will diminish in the hands of the individual surgeon in proportion to his experience, technical skill and the duration of the operative procedure.

Shock due to hemorrhage can be combatted in only two ways: first, the surgeon must not lack the courage to reopen the abdomen for the purpose of finding the bleeding points; second, transfusion and morphin represent the other measures which are of immediate value.

The acute toxemias which follow a cholecystectomy and which are characterized by a marked febrile reaction, vomiting and tachycardia can only be combatted symptomatically.

Alkalosis, evidence of obstruction, or of an ileus, is an indication for the use of large quantities of saline intraveonusly, by hypodermoclysis, and proctoclysis. At the same time relief of the obstruction is obtained by the introduction of the pezzar catheter in the first loop of distended bowel which presents on opening the abdomen.

Post-operative eventration is one of the unfortunate surprises which the surgeon may find when he goes to dress a patient, particularly if the patient has been vomiting and there is distention of the abdomen. To say the least, this complication is disagreeable, but it is one which every surgeon of experience probably has faced. The indication is immediate resuture of the abdominal wall.

This is only a brief summary of some of the causes of premature old age found among surgeons.

To lessen these complications we must be continually on the alert for anything which will make us better diagnosticians as well as better technicians.

DISCUSSION.

Dr. A. J. Comeaux, (Youngsville, La.): I agree with Dr. Cohn's statement in regard to the advisability of immediate operation in these cases. Just a few days ago I had one of these surgical emergencies. The patient was taken suddenly ill at 3:00 o'clock in the morning and I was called to see him. I saw him at 6:00 o'clock and made a diagnosis of appendicitis. At operation the appendix was perforated, one-half of it gangrenous and fecal contents had escaped into the abdominal cavity. Drainage was instituted.

I left this patient in the care of another physician and I hope that he recovers.

Dr. Joseph Cohen (New Orleans): I wish to supplement what Dr. Cohn says, especially in regard to old people. We ought not to hesitate too long to operate on old people who show signs of appendicitis, no matter what the laboratory findings are, for often their blood counts are misleading. Old people are very prone to have a ruptured and gangrenous appendix. I can recall three cases.

First Case: An old lady of 72 years, the mother-in-law of a doctor, drank a coca-cola and shortly afterwards experienced pain. On examining her I decided she had appendicitis. Her blood count and temperature were normal, but I operated anyway and found an appendiceal abscess. Drainage was instituted. Subsequently she developed a fecal fistula which healed spontaneously and she is now all right.

Second Case: An elderly lady of sixty-two, shortly after eating some nuts, was seized with abdominal pains which she attributed to indigestion. Her blood picture was normal. Examination of urine showed four per cent sugar. She was operated upon under local and in this case also I found an appendiceal abscess, which was likewise drained. The patient recovered.

Third Case: Only a few days ago a lady fifty-eight years old was seized with abdominal pains, also after eating. A consultant was called. The signs were so indefinite that he advised waiting until morning. I asked her people to allow me to operate at once, and they agreed. She had a gangrenous, ruptured appendix.

The point I wish to bring out is this: old people do not present the same picture as young people; they have not the resistance to give the blood picture and it is a safe thing to go on your diagnosis and not wait, but operate at once.

Dr. O. C. Cassegrain (New Orleans): A type of case that truly comes under the heading of surgical emergency, which on account of lack of time Dr. Cohn barely touched upon, is intestinal obstruction. In dealing with this condition, I should like to see surgeons in general adopt the same attitude towards it that is taken in handling cases of acute osteomyelitis, viz: immediate operation. We do not hesitate, in fact, we teach our medical students to cut down on the bone when acute osteomyelitis is suspected, and by so doing prevent the tremendous deformities which follow neglect, or surgery too long deferred. In dealing with intestinal obstruction delay is fatal. To wait until the condition is frankly diagnosable means death. So whenever a doubt arises as to whether we are dealing with obstruction, I think an exploratory laparotomy is not only permissible, but urgent. And this applies to every case irrespectively, the suspected and the recognized.

Four or five years ago I lost a patient with intestinal obstruction just because I was in doubt about the diagnosis. The first enema given returned frankly clear, was repeated, and again came back clear. I waited for fecal vomiting and lost thirteen to fourteen hours, by which time the patient was too toxic and far gone to derive benefit from any treatment. Since then, whenever a patient comes in with abdominal distension, with or without vomiting, an enema is given and if it returns clear, I consider that a positive reason for going in and exploring. Whether the enema is slightly colored or clear, if the patient gives signs of obstruction, by all means an exploratory laparotomy should be performed. Do not wait for the blood chemistry—go ahead and operate and save the patient's life.

Dr. Isidore Cohn (closing): Just for the benefit of everybody else, I wish to state that I do not believe Dr. Cassegrain meant some of the things he said. It does not take so long to get a chemical analysis of the blood and we should not "pooh pooh" at these laboratory aids which can be of assistance to us. Every hospital has a laboratory that can do a Wassermann and a blood chemistry and it takes but a little while to find out if there is a rather high carbon dioxide combining power and a fall in the blood chlorides. I am sure Dr. Cassegrain did not mean to give the impression that whenever an enema was given and it returned clear that the patient had intestinal obstruction.

THYROTOXICOSIS—ITS SYMPTOMS AND IMPORTANCE OF EARLY RECOGNITION.

A. G. PAYNE, M. D.,

GREENVILLE, MISS.

The thyroid gland has long demanded the attention of the internist and surgeon, from the standpoint both of diagnosis and treatment.

The diseased thyroid gland is one of the most outstanding conditions that we encounter and one of the most complex that we have to evaluate in the examination of certain patients that present manifold symptoms.

The essential cause of goiter is unknown, although it is thought that eventually it will be proved to be due either to the direct infection of the thyroid with bacteria or the indirect action on the thyroid of toxins from infections in other regions, such as the teeth or tonsils, and in the latter belief I think all will agree that such foci of infection should be gotten rid of as a preliminary to operation or treatment.

Goiter is much more common in women than men, and this is believed to be due to the fact that the thyroid is a sex gland and disturbances or diseases of the organs of reproduction are more frequent in the female than in the male.

The thyroid gland is in many respects the most wonderful organ in the body. Through its internal secretions, its influences the physical development of the child and the mental activity of the adult. It regulates the growth of bone, the formation and distribution of fat and the nutrition of the skin, teeth, hair and nails. It plays an important part in menstruation and parturition, and has much to do with the sexual desire and power. It influences the rate of the heart beat and the character of the peripheral circulation. It presides over the nitrogenous metabolism of the body and in other and perhaps unsuspected ways plays an important part in the human economy.

If thyroid secretion is excessive there are symptoms of metabolic riot. Heat production and gaseous interchange are rapid. The body tissues are stimulated to a cause of wasting dissipation. There are seen tremors, sweating, tachycardia, muscular weakness, loss of weight and feverish mental activity. The evidence of thyroid excess suggests the entrance of tragedy into the life of its subject.

If thyroid secretion is deficient the metabolism of the body is depressed and heat production and gaseous interchange are at low ebb. In the young, growth is lessened and the skeletal system is undeveloped; the connective tissue cells remain myxomatous. The skin is dry and the hair coarse and shows deficient nourishment. The nervous system halts in development and mentality does not rise above the level of the infant. Physically and intellectually the victim of thyroid poverty is less the man, more the beast.

Toxic goiters develop in patients who usually have had a simple adenomatous goiter for years. These patients, in addition to the symmetrical enlargement of the thyroid, have nervousness, tachycardia, coarse tremors of the fingers, and marked loss of weight and strength. Their basal metabolism is perceptibly increased. Unlike the exophthalmic type, they have no marked changes in the eyes. Owing to the character of the disease there is apt to develop secondary degenerative changes in certain vital organs, such as the heart, liver and kidneys.

There are two types of thyroid toxicity, primary hyperthyroidism or exophthalmic goiter, and secondary hyperthyroidism or toxic adenoma. The primary form comes from excessive secretion of the gland itself, while secondary hyperthyroidism comes from an excessive secretion of the thyroid cells within the adenoma.

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*Read before the Delta Medical Society April, 1927.

The diagnosis of thyroid toxicity in frankly toxic cases is simple. The less frank cases perhaps without exophthalmos and goiter with uncertain tremor often with little or no loss of weight, may cause some diagnostic difficulty when it comes to determining whether the symptoms are partly due to thyroidism and part neurosis, or whether they are wholly neurotic in origin. The introduction of the metabolic test bids fair and is doing much to settle many questions under discussion.

It has been demonstrated that the thyroid regulates the general metabolism of the body and that an increase or decrease of thyroid activity is accurately shown by corresponding changes in the patient's metabolic rate. Hence, by determining the degree of metabolism, we now have a scientific means by which we can estimate thyroid activity in an individual case and can tabulate mathematically the effect of the various forms of treatment that are advocated for its abnormalities.

The difficulties in the diagnosis of thyroid toxicity in general practice are many. To be able to differentiate it from the many diseases and conditions with which it may be confounded requires careful history taking, physical and clinical examination and the use of the metabolic rate estimation. Even with all the combined means available a recheck is advisable to reassure one that there is no error.

Since so much has been said about Lugols' solution being a cure-all for goiter, and since a great many patients are taking all kinds of iodine for supposed goiter, it is a good idea to question along this line, because Lugol's solution will and does mask some of the symptoms of thyrotoxicosis and makes some patients feel so much better for a time at least that they will say to you, "Oh, I do not need an operation now I feel so much better." This solution has no place in the treatment of thyroid toxicity other than preparing such patients for thyroidectomy which is the only sure cure for thyroxicosis.

There has not yet been sufficient experimentation or practical experience with basal metabolism to determine its exact clinical value, but we usually find that the basal metabolic rate corresponds pretty closely with the patient's history and symptoms and with the pathological findings of the specimen removed. On the other hand, there are so many factors to be taken into consideration that we cannot rely on the metabolic rate alone. Certainly we should have repeated readings. There is one conclusion, however, in this regard and that is that a repeated high metabolic rate means thyroid toxicity.

The onset of hyperthyroidism is usually so gradual that it is difficult to recognize it in its incipiency and here the metabolic rate will clearly differentiate it from hysteria, neurasthenia, tuberculosis and other conditions with which it may be confused. In these cases one must be extremely critical, as operative procedure in conditions of non-thyroid origin not only fails to improve the condition but actually intensifies the symptoms. Repeated metabolic estimations are of great value in these cases. Active hyperthyroidism has been found not to exist in the absence of an elevated basal metabolic rate. Hyperthyroidism with its associated increased metabolism can be cured only after the basal metabolic rate has returned to normal. Neurotic cases may at first show an elevated basal metabolism but this is found to return to normal gradually if several tests are made. The most intensely toxic thyroid patients may not have a goiter and a very large percentage of the cases of primary hyperthyroidism may have a thyroid gland of only average or normal size; a definite number have a gland smaller than normal.

The effect of thyroid toxicity on the heart is an important part in the diagnosis, treatment and prognosis of thyroid disorders. The common complaint of patients suffering from thyroid toxicity, forceful heart beat with undue breathlessness and

easy fatigue in exertion, draw the attention of both patient and physician to the heart. These same complaints occur very commonly among patients suffering with neurasthenia. It is a common diagnositic problem to differentiate heart disease, thyroid toxicity and neurasthenia.

Thyroid disease has a direct effect on the heart in certain cases and eventually affects the heart seriously. Commonly the heart rate is distinctly rapid. Even at rest in bed it tends in most definitely toxic cases to beat at a rate of 100, and rates of 150 are not uncommon. However, we occasionally see cases with a rate at times of 80.

By far the most tragic of undiscovered thyrotoxic cases are those treated for heart disease. If a careful and painstaking examination is made in so called cardiac cases we will find a great many are curable by the removal of the thyroid gland.

All cases, whether clear cut or doubtful, need careful routine history and physical examination for in many individuals with thyroid disease we find many other conflicting disorders.

It may simulate the nausea and vomiting of pregnancy and in cases of this kind who have amenorrhea, diagnosis in quite difficult.

It may simulate an acute surgical abdomen and I can implicate myself on having invaded the abdomen for the removal of organs not productive of disease and left the patient with her thyroid and thyrotoxicosis.

In sudden diarrhea or attacks of vomiting lasting for several days or several weeks, the possibility of hyperthyroidism should not be forgotten, for they play an important part in some cases with obscure symptoms, especially in some cases previously operated without removal of sufficient gland tissue.

Unaccountable loss in weight should suggest thyroid toxicity, and is commonly present. Only rarely do thyrotoxic cases gain but fluctuations in weight with fluctuations in toxicity are not uncommon.

The difficiulties in arriving at a diagnosis in many cases that come to me is my only excuse for calling to your attention such a voluminous subject—a subject that has caused me some chagrin, anguish and at times shame that I have not properly diagnosed a case when I could have done so had I put the proper amount of reasoning and study on it that I should have and saved my patient much suffering and expense.

We must realize that thyroid toxicity is of haphazard onset. It may occur to any patient any time. Its symptoms are variable. They follow no set course. Many of its common symptoms are common to the commonest of all complaints, neurasthenia.

The alert diagnostician will suspect thyroid toxicity many times in cases in which it does not exist but if he carefully confines his diagnosis the occasional correctly suspected and proved case will be a source of much satisfaction to himself and his patient.

SOME INTERESTING SPINAL CORD LESIONS*

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In presenting this subject, I have selected four cases involving the spinal cord which I think might prove interesting. Two of the cases are cauda-equina tumors; one case uni-lateral lesion of the cord giving a Brown-Sequard syndrome; and a case of an extradural abscess of the cord.

Before presenting these cases in detail, I wish to bring before you some of the most important points in the symptomatology of spinal cord tumors and also of the other two cases included in my report.

The most frequent tumors of the cord and the cauda-equina are sarcomata, chrondroma, tuberculoma, carcinoma, glioma,

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endothelioma and neurofibroma. They are found extradurally, durally, intra-durally, and intra-medullary. They may occur at all ages and at any level of the spinal cord. The most important symptoms of cord tumors are as follows: Sharply localized pain at the site of the tumor; most commonly the pain is unilateral, but may be bilateral. Motor compression signs are variable, depending upon the duration and severity of the compression. There may be parĕsis, advancing to paralysis, hypertonicity, spasticity, increased reflexes, positive Babinski, and ankle clonus. At the level of the tumor there may exist a destructive lesion, giving signs of peripheral motor neuron disease, atrophy reaction of degeneration, loss of reflexes, and tropic changes. The sensory changes are variable. However, there is usually an area of hyperalgesia at the level of the lesion which grades off into anaesthesia below the lesion. Bladder and rectal disturbances are frequent; there may be disturbances of the epicritic sense, usually diminished; also, there may be complete loss of all sensations, as well as the superficial, and deep reflexes if the compression of the cord is complete.

Symptoms of tumors of the cauda-equina give the characteristic lower motor neuron type of lesion, in contradistinction to the upper motor neuron type, given by tumors of the cord. The descending roots of the lumbar, sacral, and coccygeal nerves make up the cauda-equina, which occupies the dural sheath below the upper level of the second lumbar vertebrae, a distance of about ten inches.

Pain is one of the first symptoms which appears, often originating as lumbago, later radiating to the sacrum. The pain then becomes sciatic in distribution, often bilaterally, with intervals between attacks, and growing progressively worse. The pain is usually worse while in a reclining position. An area of anesthesia about the rectum and perineum is a constant symptom. A slight loss of bowel and bladder control is a nervous symptom, usually preceding the motor weakness. There is absence of rigidity and diminished patellar reflexes; negative Babinski and ankle clonus. Lumbar puncture here, as well as in tumors of the cord, yield a dry tap or a straw colored fluid under decreased pressure; that is if the puncture is done below the site of the tumor.

My third case, a unilateral cord injury, presents the typical Brown-Sequard syndrome. I report this case through the courtesy of Dr. Guy A. Caldwell, who performed the laminectomy. In this case we failed to determine the degree of pressure upon the cord by using the Queckenstedt test, but we felt justified in doing the operation because of the neurological findings and also the roentgenogram, which reported a fracture of the seventh dorsal vertebrae with slight displacement. The operation was performed thirty-six hours following the injury.

My fourth and last case is, I think, a rather unusual one. This case one of an extradural abscess of the lumbar cord, was also operated on by Dr. Guy A. Caldwell. I report this case through the courtesy of Dr. T. P. Lloyd and Dr. R. L. Douglas of the Highland Clinic.. This patient had been in the hospital eight days before we were sure of the diagnosis and had localized the abscess. Although this patient had complete paralysis of the bladder, we were able to avoid any troublesome infection, which is also rather unusual in these cases.

Case 1. Cauda-equina tumor — Stanton Davis, colored, male, age 45 years, admitted to Schumpert Sanatorium September 7, 1924. Complaint: Pain in back radiating down both legs. Family History: Unimportant. Personal History: Usual diseases of children. Has had no serious illness of adult life. Venereal History: Had a chancroid 20 years ago, also one two months ago. Gonorrhea several times, last time, two months ago. Present Illness: In August 1923, while laying brick, began to suffer with pain in lumbar region, which

at times was very severe. Six weeks ago pain became acute, and three weeks ago pain became confined to limbs, and sacral region. Pain radiated down both thighs, especially external surface of right thigh. The left foot became numb and for the past year has gradually grown weaker in both legs. At the present date, both legs tire easily from exertion. Neurological examination: Pupils equal in size, irregular in outline, react a little sluggishly to light and accomodation; ciliospinal reflex present; consensual reflex present. Deep reflexes: Normal in upper extremities; diminished in right lower extremity; absent in left extremity. Babinski-Oppenheim, Gordon, Chaddock, ankle clonus, and plantar reflexes, negative. Superficial reflexes: Abdominal, cremasteric, pharyngeal, and corneal reflexes present. Sensation: Normal over upper extremities and trunk. Area of anaesthesia around anus and extending over buttock for an area of about three inches, also over perineum; more over right. Sensation normal over lower extremities, except for area over lower inner surface of thighs, and over both feet below ankles, especially over external surface where all forms are absent. Cardiovascular, respiratory and gastro-intestinal systems, negative. Laboratory findings: Urine, negative; blood Wassermann, negative; Spinal fluid analysis: Cell count, 10; globulin, normal and Wassermann negative.

Procedure: Spinal puncture between third and fourth lumbar vertebrae gave clear spinal fluid, under sixteen mil. pressure. Puncture between fourth and fifth lumbar vertebrae gave a straw colored fluid under same pressure. Puncture between fifth lumbar and first sacral vertebrae yielded a straw colored fluid under same pressure. Puncture between fifth lumbar and first sacral vertabrae yielded a straw colored fluid under five mil. pressure.

Diagnosis: Cauda-equina tumor, localized at level of fifth lumbar vertebrae.

Operation: On September 16, 1924 a laminectomy was performed by Dr. J. C. Willis, Jr., and a fibroma was found pressing upon the cord posteriorly, underneath the body of the fifth lumbar vertebrae.

Case 2. Cauda-equina Tumor—White, male, age 37 years, entered Sanatorium November 2, 1927. Family History: Unimportant. Past History: Rheumatic pains in both thighs and lumbar region for several years. Venereal History: Negative for any venereal infection. Present Illness: For past seventeen years patient has suffered with lumbago. Can't remember just when pain began in thighs, but it became acute in December, 1926, with partial loss of control of both bladder and bowel, also motor weakness in lower extremities. This attack gradually diminished in severity and he regained control of his functions. On October 19, 1927, two weeks previous to entering hospital patient had an acute attack similar to the one he had experienced, so he came to the hospital for relief.

The attack began with acute pain in lumbar region radiating down both sciatic nerves, followered by loss of control of bladder and bowel, also motor weakness. Constipation was marked.

Neurological Examination: Deep reflexes lower extremities; patella reflex exaggreated bilaterally. Pathalogical reflexes: Negative. Superfical reflexes. Left crematerіc present, right, absent; upper abdominal reflexes present and lower diminished. Coordination: Heel to knee normal bilaterially. Sensation lower extremities: Tactile sense normal, with exception of area of anaesthesia extending from anus for a distance of five inches over left buttock and perineum, and three inches over right buttock, also area of anesthesia involving the back of left thigh to about three inches above knee joint and on right to level of knee joint. Protopathic sense: Same as tactile; sense of position and tuning fork sense normal bilaterally. Laboratory findings: Urine, negative; blood Wassermann, negative; Spinal fluid analysis: cell count, 3; globulin, normal; sugar, 60 mgms; total protein, 20.8 mgms; Wassermann, negative. Procedure: Lumbar puncture between third and fourth lumbar vertebrae, yielded a normal fluid pressure. Lumbar puncture between fourth and fifth lumbar vetebrae yielded a dry top.

Diagnosis: Cauda-equina tumor at level of fourth lumbar vertebrae.

Operation: An exploratory laminectomy was performed by Dr. J. C. Willis, Jr., on November 11, 1927. An extradural osteoma was exposed, about the size of end of little finger, on body of forth lumbar vertebrae.

Case 3. Unilateral cord injury—White, male, age 22 years, admitted to Sanatorium August 30, 1927. History: On the night of August 29, while driving an automobile, patient dropped off to sleep and six hours later was found near his wrecked car. He had been unconscious practically all of this time, and on recovering consciousness was unable to move right leg. He was taken to a nearby hospital and given emergency treatment and catheterized. Patient complained of the bladder and bowels and hypersensitiveness of skin over abdomen. He could move his left leg without difficulty, but his right leg was useless. Neurological Examination: Pupils, equal; regular in outline; react to light and accomodation; cranial nerves, intact; sensation, coordination and

deep reflexes, normal in upper extremities and to level of costal border bilaterally. Tactile sense lower extremities normal; pain, heat and cold diminished over right limb up to level of eight dorsal segment, and complete absence of these sensations over left limb up to level of twelfth dorsal segment; paralysis of right limb, with absense of all deep reflexes, also superficial reflexes. Tuning fork sense diminished in right limb and normal in left. Muscular power normal left limb, however, both deep and superficial reflexes absent. Laboratory findings: Urine, negative; roentgen-ray examination, lateral view, showed a curved fracture of seventh dorsal vertebrae without displacement.

Diagnosis: Unilateral cord injury presenting Brown-Sequard syndrome.

Operation: On August 30 an exploratory laminectomy was performed by Dr. G. A. Caldwell. The seventh dorsal vertebra appeared abnormally mobile and the interspinous ligaments were torn loose. The cord appeared to be angulated at the level of the seventh dorsal vertebra, and there was evidence of an extraural hemorrhage at this point. The dura was opened with escape of a large quantity of spinal fluid under pressure, but on inspection the cord appeared normal.

Case 4. Extradural abcess of lumbar cord—White, male, age 19 years. Admitted to Sanatorium August 16, 1927. History: Onset of condition July 15, with dull aching pain in lumbar region. This pain continued and on August 1 he noticed a stiffness in muscles of lumbar region. On August 14 patient developed an acute pain in lumbar region, incontinence of bladder and bowel, and loss of motor power in lower extremities. During latter part of July patient had several furuncles on his body. On admittance to Sanatorium was running temperature ranging from 99½° to 100.5°. Neurological Examination: Pupils equal, regular in outline, react normally; cranial nerves, intact; Brudzenski, marked; tremors, negative; coordination in upper extremities, normal and also sensation and deep reflexes; in lower extremities there is loss of motor power; there is complete bilateral anaesthesia from below upwards to a point about the lower one-third of leg. Above this point all sensations are normal. Deep reflexes are absent, also pathological reflexes; superficial reflexes: lower abdominal and cremisteric, absent bilaterally; upper abdominal, diminished bilaterally. Laboratory findings: Urine, negative; total white cells, 18,500; differential white cell count, N 80; SM, 17; LM, 3; total red cells, 4.500.000; hemoglobin, 80 per cent; blood culture and Wassermann, negative; Spinal fluid analysis from cisterna puncture: cell count, 2; globulin, 2 plus; total protein, 38.5 gms; Wassermann, negative; smear, negative; collodial gold curve, 0000000000.

Roentgenograms of thoracic and lumbar vertebrae on 9/22/27, showed negative for pathology. Roentgenograms of thoracic and lumbar vertebrae on 10/8/27, showed destruction of cartilagenous surfaces of 1 and 2 lumbar vertebrae.

Procedure: On August 17 a lumbar puncture was made between the third and fourth lumbar vertebrae and a clear fluid was obtained, which coagulated after having been withdrawn half an hour. It was impossible to make an analysis of this fluid. This fluid was typical of the massive coagulation of Froin, due to spinal cord compression.

On August 18 a lumbar puncture was made between third and fourth lumbar vertebrae and a dry tap was the result. Immediately following a puncture was made between second and third lumbar vertebrae and a dry tap was the result. Next a puncture was made between first and second lumbar vertebrae and a blood tinged fluid was obtained. Due to the fact that so far we had not obtained a fit specimen of fluid for analysis, we decided to do a cisterna puncture.

On August 19 this was done and a clear fluid was obtained under normal pressure, and analysis of this fluid was normal in every respect. We felt justified then in making a diagnosis of an incomplete transverse myelitis, probably due to an abscess localized at level of tenth thoracic segment, equivalent to the first lumbar vertebrae. A laminectomy was advised.

Operation: On August 23 an exploratory laminectomy was performed by Dr. Guy A. Caldwell. After removing the spinal processes of the first and second lumbar vertebrae an extradural abcess was located. As the spinal process of the second lumbar vertebrae was removed a thick white pus under tension welled up about the cord.

Comment: All of these cases have been observed from a period of three months to a year following operation: The two cases of cauda-equina tumor at the time of observation had regained control over bladder and bowel to quite a degree and also had regained much of the motor power of lower limbs. The case of unilateral cord injury was seen six months after operation. Sensation and motor power was greatly improved, and had also regained control of bladder. Patient walked with slight limp, which was hardly perceptible. This was due to a slight spasticity in right leg. Dr. Caldwell had this patient use a brace for sometime following operation.

The case of abcess of lumbar cord made a very good recovery. He was seen three months following operation and at that time was able to move both thighs slightly. He had not regained control over bladder and bowel; however, these functions had improved. Even after the maximum

improvement this patient will no doubt have a permanent paraplegia.

CONCLUSION.

1. The cases of unilateral cord injury and lumbar cord abscess show clearly the value of early laminectomy in acute compression of spinal cord. The former was operated on within 36 hours, and made practically a complete recovery, where as, the latter was not operated on until several days after onset and will no doubt have a residual paraplegia.

2. The spinal fluid in the case of abscess presented the Froin syndrome. Xanthochromia was not present but massive coagulation was, and this characteristic alone stamps it as Froin's syndrome.

3. The Queckenstedt test is a simple test and the test of choice to determine the degree of spinal cord compression. I did not use it in three of our cases because of a dry tap in two cases and xanthochromia in the fluid of the other gave me the information desired. We neglected using it in the unilateral cord injury where it would have been of value.

DISCUSSION.

Dr. L. L. Cazenavette (New Orleans): I wish to thank Dr. Kerlin for his courtesy in asking me to open the discussion and I also wish to congratulate him on his masterly presentation of these four interesting cases of spinal cord lesions.

It may be interesting to note the frequency with which spinal cord tumors are met with as compared to tumors of the brain and to tumors affecting other parts of the body. Spiller and Frazier have studied this particular phase of this subject and report that the ratio of cord tumors to brain tumors is one to six; and the ratio of cord tumors to general tumors is one to fifty. Thus we are led to the conclusion that such conditions are not met very frequently. However many observes believe and I am of their opinion, that many cases of spinal cord tumors go undiagnosed as such or are diagnosed as chronic forms of transverse myelitis, sciatica, neuritis and what not.

With regards to the symptomatology of spinal cord tumors should say that this will depend on the particular part of the cord or nerve roots involved or compressed by the growth. By far the most frequent early symptom is some form of sensory manifestation which may vary in severity from a mild paraesthesia to a most severe root pain. The distribution of the pain is most frequently in the lumbo-sacral region and extending around the body or down the extremities. This pain is peculiar in as much as it increased by certain efforts such as stooping, sneezing, coughing and straining at stool, and it is relieved by standing and walking. Of the lesser sensory manifestations hyperalgesia in a definite area is frequently an early symptom.

I recall seeing a patient whose most marked symptom was one-sided hyperalgesia in the lumbar region. A diagnosis of cord tumor was made and verified at operation.

The indefiniteness of symptoms often render the diagnosis of spinal cord tumors and cauda equina tumors difficult. Many patients have suffered for years before a definite diagnosis was made. The time elapsing between the onset of symptoms and diagnosis, operative, has varied on an average from two years to ten years. Fortunately, however, the numerous studies, observations and recent articles in the literature by neurologists in this country and abroad on this important subject especially with the help of radiography and lipiodol injections have contributed in a large measure towards earlier diagnosis. Doctor Kerlin is to be congratulated on the early diagnosis in his cases.

The case presenting Brown-Sequard syndrome following injury is of interest because of the promptness of diagnosis and relief by operation.

Now the case presenting abscess of the cord is also of interest because of the rarity of such conditions. A survey of the literature up to 1926 on the subject of spinal cord abscess and report of a case by H. W. Woltman and A. W. Adson and reported in "Brain," issue of June, 1926. They were able to collect only twenty-nine cases reported. A very low incidence as compared to abscess of the brain. They give as reasons for this low incidence: the relative smallness of the cord, the small lumen and indirect course of the vessels entering the cord and the protective location of cord compared to that of the brain which is in close proximity to several sinuses.

My congratulations again to Dr. Kerlin in reporting the thirty-first case of abscess of the spinal cord. I thank you.

Dr. Guy A. Caldwell (Shreveport): My point of view in these two cases is that of an orthopedic surgeon. The most important points in the diagnosis of the extra-dural abscess were in the history. The essential features of the story, its onset and progress, constitute a clinical picture not difficult to recognize although it is seen in the vertebrae less frequently than in other bones.

The cardinal symptoms placed in chronological order appeared as follows:

1. History of furunculosis for some time prior to onset of serious symptoms.

2. Sudden onset with a chill, high fever, and severe pain localized in the region of the upper lumbar vertebrae. These symptoms grew worse and were accompanied by intense muscle spasm and a greatly increased white cell count.

3. Persistence of these findings (referable strictly to the bony structures of the spine) for a few days, then the gradual development of paralysis,—first in one leg, then the other, and finally involving the bladder and rectum.

4. The lumbar punctures at various levels gave conclusive proof of complete blockage of the spinal canal, but examination of the fluid also demonstrated that the process was not an inflammation located inside the dural coverings.

The obvious conclusion was that we were dealing with an abscess which had developed in the body of some of the lumbar vertebrae or in the intervertebral spaces, and as it enlarged, had pressed against the cord coverings without penetrating them.

The indication to operate for relief of pressure was clear. As we went down on the spine, pus was encountered in the muscular layers, but incision and drainage seemed inadequate when the pus was seen to boil out thru the intervertebral foramina. The spines and lamina of two vertebrae were then removed but the meninges were not opened for obvious reasons. Fortunately the immediate outcome was good although the patient was an exceptionally poor surgical risk.

The prognosis as to return of function we felt was extremely doubtful but as the months have passed he has slowly regained strength and sensation and at this time (July, 1928) goes about quite actively with his braces and crutches.

Dr. G. C. Anderson (New Orleans): Dr. Kerlin very kindly asked me to discuss this paper as I am vitally interested in this type of surgery. The symptomotology has been so adequately covered by both the author and Dr. Cazenavette, that there is very little to add from that standpoint. One point I want to stress is that these patients have pain after lying down, they feel reasonably comfortable while up and about but after two or three hours sleep they will be awakened by severe pain which is relieved by sitting in a chair or walking about. Many sleep in chairs. The explanation is probably that the tumor is attached to one or more nerve roots and as the upright position is the one assumed most of the time it becomes more or less fixed in such a relationship, upon assuming the recumbent position the relationship is changed, the tumor changes position and so drags upon the nerve root.

There are a few relatively simple aids in diagnosis which I desire to mention. The first is the diagnosis of a subarachnoid block by the Queckenstedt test or as it is called in this country the "response to jugular compression." A spinal puncture in the lumbar region is done in the ordinary way the patient lying upon his side; a manometer is connected with the needle and a pressure reading taken after waiting three minutes or so for the patient to become composed and comfortable, the neck should not be flexed. Light pressure upon the jugular veins upon either side of the neck will cause an increase in intracrania pressure by interfering with the venus drainage, this pressure forces the cerebrospinal fluid out of the ventricles and down the spinal canal and the level of the manometer reading will rise sharply and fall when the pressure is removed. This is a simple and easy test, a spinal manometer is not required as the ordinary mercury manometer used for bold pressure readings may be used.

The second method is the introduction of air into the spinal canal after withdrawal of cerebrospinal fluid. The air will rise as high as the block and this level can be determined by roentgenological examination. At the time of injection the patient will probably report severe pain in the region supplied by the nerve roots at the level of the lesion due to pressure at that point.

The third measure is the use of lipiodal, a 40 per cent iodized oil, which is introduced into the subarachnoid space. It may be injected either below or above the lesion as one seeks to determine the lower or upper level. The substance is denser than cerebrospinal fluid and will sink. If injected below the suspected level to determine its lowest point the patient will have to be inclined upon a table with the head lower than the feet. As the substance is opaque to roentgen-rays such an examination will show the level at which it is arrested in case of a block. A certain amount of irritation follows its use but this should not prove a deterent when it is felt it will be of diagnostic aid. The general procedure is to introduce the lipiodal in the cisterna magna and sit the patient upright for roentgen-ray examination.

I think the most interesting case was that of the abscess as brought out by Dr. Cazenavette. Only a small number of such cases have been reported in the literature. In the last issue of the Journal of the A. M. A. Dr. McDonald of Minneapolis repored one such case. Of course

it is an unusual disease in which one case is considered sufficiently important to report in such a journal as that of the A. M. A. and I think this case should be added to the few we have on record. I thank you.

Dr. A. A. Herold (Shreveport): With permission of Dr. Kerlin and Dr. Caldwell, I had occasion to see the young man referred to in the paper. I saw him on behalf of an insurance company, in connection with the total disability benefit. He was deeply grateful to Dr. Kerlin and Dr. Caldwell for having saved his life, but was disappointed that he had that persisting paralysis.

Two interesting points came to my mind in connection with that case; one is what determined that metastasis from the furuncle? It must have been some strain or trauma that weakened that point on vertebrae. I could not get that quite clearly from his history. The other question is, has he a total and permanent disability, from the insurance standpoint? I reported to the company as I found him. He was a bank clerk by occupation, he still has the use of his mental faculties and his upper extremities, no use of his lower extremities, and the question was whether his is a total and permanent disabiliy from the insurance standpoint; or inasmuch as he can still be a clerk and be rolled around, hasn't he still some capacity for work?

Dr. Chaille Jamison (New Orleans): I understand that cauda equina phenomena is brought out far better by the use of water than the ordinary mercury manometer in general use in estimating pressures on the spinal fluid. I would like to ask Dr. Kerlin if he can give me any information, is the water phenomena necessary, and is it done?

Dr. C. S. Holbrook: There are one or two points I wish to stress. One is for an early diagnosis, after complete paralysis has taken place, little benefit is going to be brought about by removing the tumor. If these patients are to be greatly helped, they should be operated on early. We frequently see these patients after bladder and rectum have been thrown out of commission, after they are completely paralyzed from some level down, and then there is little or no chance of anything like an adequate improvement or recovery. Some slight improvement may take place depending upon how much destruction has taken place; but to wait and delay operating until these absolutely positive signs are present, is losing a great deal of valuable time.

We have recently seen several tumors that illustrate the various points brought out, and one was last week, a man we could not get to bed, because lying down increased his pain to such an extent that it was almost impossible to keep him in the hospital, he felt so much better being up. Dr. Kerlin made the statement, and I do not believe he meant in all cases that the pain was localized at the site of the tumor. The pain quite frequently is at the distribution of the nerves involved and no focal pains at all, however tumors of the lower spine generally gives pain in the region of the lesion.

Dr. W. J. Otis (New Orleans): There is moral attached to Dr. Kerlin's paper which is "do not treat all back-aches and pains as an old-fashioned bach-ache." Any prolonged pain in the lumbosacral area with saddle hypersthenia and anesthesia, plus bilateral sciartica over any length of time should be investigated thoroughly from a neuropsychiatriac standpoint, always keeping in mind involvement of the cauda equina or areas above this. Contact of these cases aid much in preventing disabilities which follow.

Dr. D. L. Kerlin, Shreveport, (closing): I certainly appreciate the discussion by the doctors, of my paper, and in conclusion, there is one question I will answer. Dr. Herold broached the subject of whether or not there was any trauma in producing the initial symptoms of this condition. There was none. He absolutely gave no history of any trouble, and the condition came out of a clear sky, you might say.

In answer to Dr. Jamison's question as to whether or not there is any advantage in using the water in doing the test, I do not think there is any advantage. We advocate the use of water because it is very simply done. Personally, I think the test with the spinal manometer is just as good, and if you have the spinal manometer, it will give you the evidence that you desire. I thank you.

ADMIRAL GRAYSON HEADS GORGAS MEMORIAL.—Formally accepting the presidency of the Gorgas Memorial Institute which was recently tendered to him at the annual meeting of the Board of Directors, held in Boston, Rear Admiral Cary T. Grayson announced that it would be his purpose to maintain the field operations of the organization and to expand its publicity features as far as funds will permit.

ANALYSIS OF THE HISTORY IN THE DIAGNOSIS OF HYPERCHLORHYDRIA.*

OSCAR W. BETHEA, M. D.,

NEW ORLEANS.

The diagnosis of hyperchlorhydria has assumed greater importance in consideration of the present view that it is largely responsible for precipitating attacks of migraine and other forms of headache, and that it is an important factor in initiating and perpetuating peptic ulcer.

In investigating diseases of the stomach, there are several avenues that may lead to information of value. These are, the analysis of the history of the case, the physical examination, the roentgen-ray examination, the laboratory investigation, and the therapeutic test. These are all of value, and it is advisable that the first four be employed in every instance. It has seemed to me, however, that the analysis of the history has not been sufficiently emphasized by teachers and by writers upon this subject. It often gives more information than can be obtained from any other source, and sometimes may supply all the data that is actually essential. It is not intended here to discourage the effort at thorough investigation, but it occasionally happens that complete laboratory facilities or the roentgen-ray are not available, except with considerable inconvenience.

I began the practice of medicine with the expectation of doing repeated gastric analyses, and having a complete roentgen-ray study on all patients who presented themselves with gastric symptoms. My interest in other phases of investigation was stimulated by my experience with two of the earliest patients that presented themselves. The first of these patients walked into my office, where I was sitting alone and lonesome. She was a nice appearing individual, and a decidedly pleasing prospect to a young doctor to whom any type of patient was a rare vision. I began talking the history and among the first questions, asked if she had had a gastric analysis. She replied that she had been to several doctors and they all wanted to wash out her stomach; that she had not been back to any of them, but had finally decided to come to me. I am somewhat ashamed to say that, so far as I am concerned, this good lady's stomach contents have not been analyzed to this day! She did, however, make an uneventful recovery, the treatment being based upon what data I could gather without risk of causing her to seek further for advice. Soon after this, another stomach patient fell to my lot. He was a man in the early forties. He refused a gastric analysis, but did consent to a roentgen-ray study. I received a report, prompted by all the assurance of the radiologists of those days, giving a positive diagnosis of gastric carcinoma. On the strength of this, I got the man with his family and as gently as I could, broke to them the distressing news. I demanded an immediate operation as the only possible hope of benefit. They asked for a short time to consider the matter, and the next day telephoned that he had turned to Christian Science! I still see this man walking the streets, stronger and healthier, it seems to me, each year. I am quite sure that in the First Church of Christ Science at Boston, there are complete records of a Mr. R. of New Orleans, who was absolutely proven to be in the last stages of cancer of the stomach and given up to die by a great city physician (even me) and who was completely and permanently cured by the beneficient and healing influence of Eddyism!

The following plan of history analysis has been used in my hospital services, and in teaching my classes for some years. It should be remembered that few cases are entirely typical, but bearing in mind the following factors in taking the history of a suspected case of hyperchlorhydria may aid much in establishing a diagnosis:

*Read before the South Mississippi Medical Society, Sept. 13, 1928.

Course of the Disease: The process may last for many years, and usually shows periods of comparative or complete comfort. This often enables us to exclude carcinoma.

Gain or Loss of Weight: When a well-nourished, full-blooded individual walks into my office and complains of stomach trouble I instinctively think of hyperchlorhydria. The tendency is to an increase in weight, this is in contra-distinction to hypochlorhydria and carcinoma, in which the tendency is to loss of weight. We must remember that in hyperchlorhydria there is an excessive amount of acid, and often of all the gastric secretions. We may expect, therefore, as a rule, rapid gastric digestion and thorough assimilation. Not only is there a rapid emptying of the stomach, but this gives rise to an early hunger reflex, therefore, these patients have a good appetite and many have learned that the frequent taking of food tends to comfort. It is not unusual to find cases where there has been an actual loss of weight, but a careful investigation usually reveals the fact that this is a result of efforts at treatment where the diet has been arbitrarily curtailed.

Pain vs. Discomfort: In hyperchlorhydria there is usually a definite pain that is often described as burning, cutting, or stabbing in character. This is in contra-distinction to hypochlorhydria in which there is only a dull discomfort, or a sense of weight or fullness. This pain of excessive acidity is usually in the epigastric region, or may be described as a burning streak that follows the course of the esophagus. It is not unusual to have a patient exactly map out the course of the esophagus in showing the location of the discomfort.

Time of Onset of Pain: In hyperchlorhydria the pain is usually the result of the acid gastric juice coming into contact with the mucous membrane. It therefore develops as the stomach empties, the average time being about two hours after meals, depending upon the character and amount of the food taken. If the food has been of such a character as to favor the formation of acid, the pain may be more intense. The patient may be awakened by the pain during the night, or it may be present upon awaking in the morning. It may be precipitated by missing a meal. This, of course, is in contra-distinction to the discomfort of hypochlorhydria, which results from the presence in the stomach of food that is not being properly digested, the discomfort developing soon after meals and subsiding as the stomach empties.

Duration of Pain: In hyperchlorhydria the pain may last until food (or some alkali) is taken into the stomach. In hyporchlorhydria the comfort lasts till food is taken into the stomch, and discomfort is present only while food remains in the viscus.

What Causes Pain: Pain may be precipitated by the emptying of the stomach after a meal, by missing a meal, or by food material that in itself proves an irritant. This is in contra-distinction to the discomfort of hypochlorhydria.

What Relieves Pain: Pain is usually relieved by the taking of bland food, often a drink of cold water will sufficiently dilute the acid to give comparative relief. Vomiting of the acid material will usually give temporary relief. Most patients soon learn that alkalies such as sodium bicarbonate, or some of the proprietary remedies will give relief. This, of course, results from the neutralization of the acid present.

Eating of Acids: Patients having hyperchlorhydria will seldom eat pickles, vinegar dressings, lemons, or other acid material. They either avoid these, knowing that they cause pain, or they unconsciously omit them from their diet, probably being robbed of a desire for such foods through the protective processes of nature. This is in contra-distinction to hypochlorhydria, where the desire for these articles of diet is sometimes marked.

Eating of Sweets: This does not give as reliable information as the matter of acids,

but many of these patients are conscious of the fact that certain sweets may precipitate pain, and others seem to lose their desire for such foods, as has been described in the preceding paragraph.

Eructations: In hyperchlorhydria there is a tendency to the eructation of acid fluid. This is often distinctly uncomfortable, causing irritation of the esophagus, and sometimes producing distinct discomfort in the pharynx and mouth; considerable irritation may sometimes be observed by inspecting the area visable. These eructations usually occur about two or three hours after meals. In hypochlorhydria the tendency is for the regurgitation of more or less unchanged food; this does not seem to cause material discomfort.

Headache: This is one of the most valuable findings in establishing a diagnosis in the patient's under consideration. Not only that, but the proper interpretation of this headache often leads to results in treatment that are quite spectacular. The headache may range anywhere from a simple dull pain to the severest type of migraine. Dr. Thompson in his "Clinical Medicine" stated that, in his opinion, about twenty-five per cent of all attacks of migraine were precipitated by hyperchlorhydria. My experience leads me to place it at more than fifty per cent. The headache of excessive acidity develops several hours after meals. The patient may be awakened by it during the night, may have it upon awaking in the morning, or it may develop about ten or eleven o'clock in the forenoon, or three or four o'clock in the afternoon. It may be precipitated by missing a meal. It is often associated with nausea, and sometimes with vomiting. It may be relieved by the taking of food, or alkalies, or it may persist for many hours, or even for several days. I believe that in making an etiological diagnosis of a chronic tendency to headache that hyperchlorhydria must always be considered as a possible cause.

Last, but not least, we must search for information looking toward the known factors favorng the development of excessive gastric acidity. Among these should be mentioned: Chronic appendiceal involvement, chronic gall-bladder disease, and faulty habits of eating.

A careful evaluation of the data obtained by a history, as here suggested will, at least, enable us to better interpret the other fiudings resulting from a complete routine investigation.

COCCOGENIC INFECTIONS

T. A. MAXWELL, M. D.,

NEW ORLEANS.

The term coccogenic infection is used to cover lesions due to the ordinary streptococcus and staphlycoccus which normally inhabit the skin and which do not produce any lesions as long as the intgument is intact. There are two main classifications of this condition as usually observed:

(a) Comprising the skin lesions caused solely by these organisms, classed under the general term, impetiginous lesions; (b) impetiginous lesions engrafted on a primary condition such as in scabies, generally spoken of as secondary infections.

There are no skin lesions, which, at some time or another, will not become secondarily infected due to irritants applied externally or to the scratching of the lesions by the patients themselves as a result of either an itching or burning sensation so common in skin diseases.

A local lesion that is presented for examination may generally be covered with crusts, a manifestation of inflamation with exudation. These crusts may be situated in certain areas the location of which suggests the diagnosis of some particular skin condition as scabies or lues.

Upon examining the crusts, it is often all that can be seen and as far as can be gone in the diagnosis except in such exceptional cases as the ruptial crusts of pustular lues. In questionable cases if a saturated solution of boracic acid is applied on the crusts for several hours a day or if the crusts are very numerous, use is

made of the boracic acid bath, in many instances these crusts will be easily removed and found to be the results of a superficial coccogenic infection. The case is thus cleared up in a few days and the patient is cured. In this class are the cases of common sores, as the laity call them, which recur every summer and make the patient look most unsightly, especially when the major part of the lesions are situated on the arms and legs. After removal of the crusts with the boracic acid pack sterilize the field further through an application of ointment of ammoniated mercury, 5 per cent in adults, and in children a smaller percentages, even as low as one-half of 1 per cent in babies a couple of months old. Sterilizing the lesion in older children and adults with a 75 per cent silver nitrate solution works very well.

Another class of cases presents crusts on different parts of the body. In some instances, as in scabies, the crusts are found on the areas which are frequented by the Acarus. The concomitant lesions, as the vesicles in the wings of the fingers and burrows, make clear the diagnosis of scabies with a secondary infection. In this condition treat the scabies before expecting to cure the patient.

Again, cases present themselves with a large crusted lesion on the face that has persisted for some time. Very often, due to the longevity of the lesions, the crust has a pseudo rupial appearance and the diagnosis of syphilis is made. So far, in such a case, the crust alone is observed, which simulates lues, because of its rupial character. But if the patient is ordered a boracic acid pack and returns in a few days, the crust will be practically removed. The lesion itself will stand out for real examination as to its contour, its wall and base. I do not believe that crusts should be forcibly removed when we have at our command an agent which does it in a more humane manner.

I have had several such cases in my practice similar to those I mentioned above. When the crusts were removed the diagnosis of blastomycosis was easily made, illustrating the fact that the ordinary coccogenic infection may mask a serious condition while many serious looking lesions are due to coccogenic infection alone.

In closing I wish to state that there can be no damage done by the use of saturated solution of boracic acid while a great deal of good often accrues. In five years time I have seen only one patient in whom a saturated solution of boracic acid, caused a dermatitis.

REVIEWS

SURGICAL DISEASES OF BILIARY SYSTEM*

NEW ORLEANS.

EARL GARSIDE, M. D.,†

Many recent advances in our knowledge of biliary diseases have resulted from newer conceptions of physiology. The experimental data given to us by such physiologists as Whitaker, Boyden, Mann, Rous, and others has elucidated many obscure phenomena of the biliary system. These advances have caused us not only, in a great measure, to change our surgical procedures but also to change our conception of many fundamentals which we embody in our teaching. There are many normal functions of the biliary system which are not clearly understood. Recent investigations are giving an insight into probable causes of early abnormal changes, the recognition of which is most important..

*Presented before the Surgical Faculty of Tulane University, November 19, 1928.

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EMBRYOLOGY.

A brief consideration of the development of the biliary system lays a foundation for a more comprehensive understanding of the anatomy and physiology and for a better conception of surgical diseases as recognized clinically.

The liver develops from a hollow outgrowth or diverticulum on the ventral surface of the duodenal portion of the fore-gut. This diverticulum is lined with endoderm and grows into a mass of mesodermal tissue—the transverse septum. Strands of cells called trabeculae soon enclose the vessels of the vascular network in the septum. The trabeculae becomes hollowed out, forming bile capillaries, which empty into the proximal portion of the original hollow diverticulum, from which the bile ducts are formed. The gall bladder first appears as a solid bud on the common duct, and soon enlarges and becomes hollow. The development of the pancreas is closely related to the development of the biliary system in that the ventral portion appears as a diverticulum from the primitive bile duct and forms a portion of the head of the pancreas and uncinate process. The duct of this ventral portion maintains its communication with the bile duct and becomes the main pancreatic duct, while the duct of the dorsal portion of the pancreas forms the inactive, and often obliterated, accessory pancreatic duct.

ANATOMY AND PHYSIOLOGY.

The liver receives both venous and arterial blood, the former under very low pressure from the capacious portal vein and the latter under very high tension from the small hepatic artery. As these two spread out into the intricate capillary network, they are very intimately related with the liver cells. Krogh[1] considers that the endothelium of the hepatic capillaries is a syncytium with numerous nuclei but without defined cell borders, as in embryonal capillaries. The liver cells are directly bathed by blood and not by lymph as are cells elsewhere in the body. The blood drains away from the liver by way of the hepatic veins. This flow is diminished 60 per cent by obstructing the hepatic artery. The hepatic arterial flow may be altered by vaso-constriction, but the portal vein flow is dependent on changes occurring at either end of the distribution of the vessel, that is, changes in the liver itself or in the intestines, the latter being the more important, but both are influenced by splanchnic dilatation.

The unit of the liver is the hepatic cell, and this complex work-shop is capable of a multiplicity of activities. Among the better understood functions of the liver perhaps the most important is that of sugar metabolism. However, it is commonly known that serious hepatic disease may occur without disturbance of carbohydrate metabolism. Mann et al.[2] states that carbohydrate metabolism seems to be complete and normal in the dehepatized animal, as is evidenced by utilization of glycogen and glucose without the formation of any recognizable abnormal products. Glucose in proportionately larger amounts must, however, be administered after removal of the liver, since the carbohydrates normally formed from amino acids and protein metabolism are not available. It is interesting to note that Mann[2] found that muscle glycogen does not disappear in the dehepatized dog, indicating that the sugar that reaches the blood comes only from the glycogen of the liver. Therefore, it would appear that the concentration of sugar in the blood is regulated by the amount released into the general circulation by the liver after it reconverts glycogen into sugar. Normally this concentration is so uniform that we may include it in the group of physiological constants along with the temperature, the pulse, the blood pressure, etc.

Deaminization of amino-acids depends directly on the liver as shown by Mann.[2] He made observations on 50 dogs surviving removal of the liver from 8 to 30 hours. The formation of urea ceased immediately upon removal of the liver, and when amino-acids were injected the entire amount was recovered unchanged. These observations

seem conclusively to demonstrate another very important function of the liver.

The role of the liver in fat metabolism is not as yet very clearly understood. It is demonstrable, however, that as the glycogen disappears from the liver, the liver accumulates fat. MacLeod[3] thinks that the liver converts the fat molecule into a state such that its potential energy can be transformed into dynamic energy.

Likewise the function of the cholesterin metabolism of the liver is not well understood. The liver is a known detoxifying organ, the proteins arriving from the portal circulation being detoxfiied by it. Fibrinogen is also known to be formed in the liver.

Of more clinical interest, however, than the metabolic functions of the liver, are its excretory functions. This is demonstrated by the fact that most hepatic tests which aim to measure its metabolic capacity have been discontinued and more reliable tests have been instituted which are based on a measurement of the liver's excretory function, referring, of course, to such tests as van den Bergh and excretion of various dyes, such as phenolsulphonephthalein.

Though clinically interesting, bile pigment formation is perhaps one of the least important functions of the liver. Bilirubin is known to be added to the blood as it traverses the liver, but the same is known to occur in the spleen and bone marrow also. It is definite that the formation of bilirubin depends upon the activity of the reticulo-endothelial system, one part of which, of course, is found in the liver. It is interesting to note also that jaundice develops rapidly after complete removal of the liver. The source of the bile pigment can be determined by the van den Bergh test for bilirubin concentration in the blood, in that, in the blood going to the liver color can be produced only by addition of both the diazo-reagent and alcohol, whereas in bile itself the color appears immediately upon addition of the diazo-reagent alone.

Investigation is now being made by Aldrich and Green on a method of measuring bile salt excretion. This should prove of more clinical value than the estimation of bile pigment excretion.

The gall bladder is a pear-shaped, distensible pouch hanging in a dependent position by attachments to the under surface of the right lobe of the liver. It normally holds approximately 30 c.c. of bile, and is never seen completely collapsed or empty. At early morning operations on the abdomen the gall bladder is usually found well filled (the fasting condition). It has a rich blood supply from the cystic artery and from many small vessels which are in its attachment to the liver.

The cystic artery is normally a branch of the right hepatic artery, and, it should be remembered, passes downward and forward, and lies on the medial side of the cystic duct and neck of the gall bladder. The wall of the gall bladder consists of a mucous membrane, a sub-mucous layer, in which are large and active lymphatics, a muscularis, with elastic and connective tissue, and a serosa, beneath which is a sparse arrangement of lymphatic vessels. The lymphatic supply has a free communication with the liver through the gall bladder attachment and with nodes found in the hilus of the liver, at the juncture of cystic and common ducts, along the common duct, and around the head of the pancreas and first portion of the duodenum.

The known functions of the gall bladder are concerned with the concentration and storage of bile, the secretion of mucus, and the regulation of pressure in the duct system.

There can be no doubt that much more bile is absorbed through the wall of the gall bladder than is emptied through the cystic duct. Halpert[4] and Sweet[5] even go so far as to say that the primary function of the gall bladder is bile absorption and that bile once having reached the gall bladder never leaves it through the cystic

duct. Boyden[6], Silverman and Menville[7], Winkelstein and Aschner[8], Mann and Higgins,[9] however, have demonstrated that the gall bladder does empty through the cystic duct, though there is some variation in their respective opinions as to the mechanism by which the emptying is accomplished. Boyden[6] considers that the gall bladder is a passive agent and that the active factors are the secretory pressure of the liver, the regulatory action of the sphincter papillae, and intra-abdominal pressure. Winkelstein and Aschner[8] consider that the respiratory mechanism is the "motor of the gall bladder," while Mann, in his work on fish, guinea pigs, and dogs, and Whitaker,[10] using the cholecystographic method of Graham and Cole, and Hamrick,[11] employing roentgen-ray observation of the gall bladder filled with iodized oil, report ample evidence that the gall bladder empties chiefly through the activity of its intrinsic muscular contractions. Westphal[12] lays emphasis on the action of the sphincter of the common duct and calls attention to its sympathetic stimulation and vagus inhibition. This antagonistic action causes contractions, which empty periodic spurts of bile into the duodenum.

The quantity of bile leaving the gall bladder by the cystic duct in the course of twenty-four hours is very small, and represents only about one-tenth (Hammerstein, one-twentieth) of the bile formed by the liver.

The bile capillaries form the intra-acinous small bile-ducts which can be traced to the capsule of Glisson. The branches arising in the right and left lobes of the liver respectively are separated until they form the hepatic duct. No important anastomosis between the right and left lobes could be demonstrated by Counsellor and McIndoe.[13]

The hepatic duct is the excretory duct of the bile coming from the liver. It contains circular muscular fibers, mucus secreting glands, and pouch-like sacculi. These sacculi often dilate after removal of the gall bladder and even take on some of the absorptive functions of the gall bladder itself. The cystic duct branches off from the hepatic duct, and usually runs parallel with it, but at times may form a spiral around the hepatic duct. It is three to four cms. in length, is poor in muscle fibers, and is rich in lymphatic glands. Its rich nerve supply accounts for the severe and widely radiating pains in affections of the cystic duct. At the point where the cystic duct enters the gall bladder its mucous membrane is thrown into folds—the valves of Heister—which may at times be so thick as to narrow the lumen and even cause intermittent obstruction (Schmieden[14]). Lutkens[15] holds that there is a sphincteric action of the cystic duct, any spasm of which causes obstruction.

The common duct is nine to ten centimeters long, and its diameter is that of an ordinary lead pencil. One-third of the duct lies above the duodenum and two-thirds behind it. In about 90 per cent of cases the duct passes behind the head of the pancreas before it enters the duodenum. At the lowermost portion is smooth musculature, forming the sphincter of the common duct, which was described by Oddi in 1887. Westphal,[12] Whitaker[10] and others have shown that constriction of this sphincter aids in filling the gall bladder by increasing the pressure in the ducts, and that a relaxation of the sphincter must occur before emptying of the gall bladder is possible. No doubt our future knowledge of the flow of bile, stone formation, and bile duct physiology will result from a more complete understanding of innervation. All of the bile ducts secrete some mucus which dilutes the bile somewhat. An excessive accumulation of this mucus may cause partial obstruction and symptoms of biliary colic.

There is at least one lymph node on each the common, the cystic, and the hepatic ducts. They have a definite size in health, and the surgeon has learned to recognize their enlargement in disease. Their size

rather consistently depends on the degree of infection present.

Anomalies of the liver and gall bladder are rare. The presence of two livers in a human being is the rarest known anomaly. Morgagni reported one such case; the gall bladder was absent. The next rarest anomaly is the congenital absence of the gall bladder and all ducts. The condition is not incompatible with life, as is evidenced by the fact that the average duration of life was seventy days in the 13 cases reported in the literature, one of these patients living 216 days. The next rarest anomaly is the absence of the gall bladder, cystic, and common ducts. Bower[31] reviews 14 such cases previously reported, and reports one such case of his own. This condition is, of course, compatible with life, two cases having lived 60 years and their deaths then being due to causes to which the anomaly was not contributory. There are 31 cases reported in the literature of absence of gall bladder and cystic duct. Willis[16] reports a case of congenital dilatation of the common duct, and reviews 59 cases previously reported. This cystic dilatation of the duct reported by Willis[16] contained 400 cc. of bile and was discovered during a laparotomy for chronic appendicitis. According to McWhorter[17] the correct diagnosis has not been made in any case prior to operation. Approximately 170 cases of congenital atresia and stenosis of the bile ducts have been reported (Ladd[18]). Moynihan[19] feels that they are due to intra-uterine obliterative cholangitis. Other theories of causation are: 1. Congenital syphilis; 2. fetal peritonitis; 3. congenital malformations.

Of more clinical interest are the anomalies of the hepatic and cystic arteries. Flint[20] reports that in 21 per cent of cases the right hepatic artery may arise from the superior mesenteric artery. In 3.5 per cent there are two right hepatic arteries. The cystic artery arises from the right hepatic artery in all but 2 per cent of cases. In 15 per cent of cases there is an accessory systic artery. The cystic duct may join the common duct at any point between the usual position and the ampulla of Vater, or may even open into the duodenum separately. There is only one type of accessory bile duct—it is an accessory right hepatic duct and occurs in 14.5 per cent of cases.

JAUNDICE.

"Jaundice, or icterus, is a condition characterized by coloration of the skin, mucous membranes, and fluids of the body by bile pigment" (Osler). Jaundice is, of course, a symptom and not a disease. It is, however, so closely associated with diseases of all three components of the biliary system that it deserves consideration under a separate heading.

If we accept McNee's[21] classification and exclude that rare and little ndeurstood type of icterus — familial jaundice — there are only three important types which we must consider clinically. Two of these types,—toxic and haemolytic jaundice—are of lesser importance to the surgeon. McVicar[22] prefers to classify jaundice as: 1. hemolytic; 2. intrahepatic; 3. obstruction within ducts; 4. obstruction by compression.

The type of jaundice with which the surgeon must deal is obstructive jaundice. Its most common causes are:

1. common duct stones;

2. empyema of the gall bladder, with cholangeitis;

3. stricture of common duct;

4. tumors of the head of the pancreas (usually carcinoma, rarely inflammatory).

The chief responsibility is to differentiate between surgical and non-surgical types of jaundice. General functional impairment of the body and tissues of jaundiced patients is evidenced by loss of weight and strength, the tendency to diarrhea, and a prolonged coagulation time of the blood. However, these common general manifestations of jaundice are not specific, and a differentiation must be made on a few significant points, *i. e.* 1. pain; 2. access of bile to the intestinal tract;

3. serum pigment as determined by van den Bergh reaction. The presence or absence of pain is of the greatest importance in diagnosis. In hemolytic and intrahepatic jaundice and in obstructive jaundice, due to pressure on the common duct from without, pain is typically absent. Cases of stone in the duct rarely occur without characteristic colic.

The greatest difficulty in diagnosis is encountered in painless jaundice. In higher grades of bilirubinemia the hemolytic type can easly be excluded and the differentiation must then be made between intrahepatic jaundice and compression of the common duct by an extrinsic tumor. Such a tumor is usually a pancreatic tumor and almost invariably a malignant one. Painless jaundice, therefore, in patients under 35 years of age would be evidence against pancreatic tumor. Above that age complete absence of bile in the duodenum or stools would be suggestive of carcinoma of the head of the pancreos or, less commonly, of the ampula of Vater. A solitary cholesterol stone may also produce painless jaundice and should always be considered as a possibility.

However, after a period of careful investigation during which time appropriate preoperative treatment has been instituted, if there still exists a doubt as to the type and cause of jaundice, the patient should be subjected to an exploratory operation.

The measurement of the bile pigment in the blood serum by the method of van den Bergh is a reliable index of bilirubin concentration. It is sensitive and rises or falls before changes in the tint of the skin and sclera can be appreciated. Its differentiation of the source of bile pigment is likewise helpful in making a diagnosis. Determination of the icterus index is not difficult and when repeated frequently becomes a valuable adjunct to prognosis as well as diagnosis. As has already been stated, tests of liver metabolic function are disappointing in their results, and are of little diagnostic value in jaundice.

The patient with jaundice which can be classified as of the surgical type should, of course, be advised that operation is the only rational procedure. The surgeon should, however, be aware that surgery on jaundiced patients is replete with difficulties. The greatest hazard is tendency to hemorrhage.

Walters[23] has added materially to the possibility of successful operation on these patients by introducing the use of calcium chloride in the preoperative preparation of jaundiced cases. The dose recommended by Walters is 5 cc. of a 10 per cent solution given daily by intravenous injection for three days prior to operation, care being taken to get none of the solution outside the vein, as slough is very likely to follow such an accident. The very definite reduction of the mortality rate at the Mayo Clinic following introduction of calcium quickly installed it in universal clinical use. It is recognized as valuable by most surgeons, but some do not place as much dependence on it as do the surgeons at the Mayo Clinic. Judd, for example, considers that blood transfusion will only be necessary in a small percentage of cases, and these are usually extreme cases which continue to ooze blood post-operatively. Percy,[24] Cole,[25] Lahey,[26] and others, however, feel that though calcium chloride be used pre-operatively, surgery should not be undertaken on jaundiced patients without giving one or more blood transfusions. Recently Wagensteen[27] has shown that although calcium chloride is a reliable agent for reducing delayed coagulability, there are, attendant upon obstructive jaundice, changes in the blood vessels, as well as the blood itself, and also there is destruction of liver tissue and consequent diminution of liver function. None of these abnormal changes are materially affected by calcium therapy, and one should therefore, not lose sight of the known value of intravenous glucose in hepatic insufficiency, and the effectiveness of transfusion in hemorrhage.

The blood coagulation time and serum pigment concentration are the best guides as to the optimal time for operation. In a review of operative cases over a period of five years at the Mayo Clinic, Walters[23] found that 70 per cent of deaths from hemorrhage occurred in patients with a clotting time of more than nine minutes. Likewise disaster is imminent in operations undertaken during the time the serum bilirubin is increasing.

Equally important as other pre-operative preparatory measures is the administration of large amounts of fluids and the giving of a diet rich in carbohydrates. When anorexia or nausea is marked glucose solution and other fluids may have to be administered through a duodenal tube, or by proctoclysis, and even sometimes by intravenous infusion or hypodermoclysis.

The occurrence of post-operative complications in jaundiced patients will, of course, be minimized by proper pre-operative treatment. The most frequent and most dreaded complication is hemorrhage. It is relatively rare to see any sudden copious hemorrhage if the technic of the operative procedure has been properly executed. What usually occurs in these cases is a continuous oozing. The surgeon should brook no delay in employing measures to bring it under control. No doubt one of the best procedures at our command is blood transfusion.

A pallid, apathetic patient excreting increasing amounts of pale, thin bile suggests post-operative hepatic insufficiency. The urinary output and blood urea usually remain normal. Intravenous injections of 5 per cent to 10 per cent glucose have been of considerable value in the treatment of this type of complication. Since slow administration of relatively large amounts of glucose solution is indicated, the intravenous drip as suggested by Matas[28] will prove very useful. In cases in which a "T" tube or catheter has been placed in the common duct, McArthur[29] prefers to introduce the glucose directly into the intestinal tract by way of the tube.

The diseases of the liver which the surgeon is called upon to attend are not numerous. By far the greater number of hepatic dysfunctions are treated medically; however, many are not amenable to treatment of any kind.

Injuries of the liver may be due to blows, crushes or falls, or to gunshot or stab wounds. Subcutaneous wounds are of three kinds:

1. Rupture of hepatic tissue combined with rupture of the capsule;

2. Separation of the capsule with subcapsular haematoma;

3. Central ruptures, which often give rise to separate or united haematomata which may develop into cysts or abscesses.

Open wounds may be of any conceivable complexity, character, or extent. Wounds may be single or multiple. The right lobe is injured six times as frequently as the left.

The two serious features in all wounds of the liver are hemorrhage and infection—the former is the more grave.

Treatment: In open wounds there can be no question as to the immediate necessity for operation. Other organs may be injured, foreign bodies may be within the wound, bleeding may still be going on, and contamination may be such as to require free opening and adequate cleansing.

In cases of subcutaneous injury the need for operation is by no means so imperative. Recovery may follow conservative treatment, but an unsuspected tear may be found at exploratory operation. If there are signs of shock, fluid in the abdomen, and muscular rigidity, an immediate operation should be advised. Determination of the percentage of hemoglobin and number of erythrocytes may be of some diagnostic aid. Also leucocytosis is a rather constant early finding in abdominal hemorrhage.

Operation: The liver may be exposed (Moynihan[30]):

1. Through an anterior incision opening the peritoneal cavity as in exposure of the gall bladder.

2. Through an anterior incision along the 7th or 8th ribs, which later are resected. The pleural cavity is traversed and the diaphragm incised.

3. Same as (2) except posterior incision.

4. Same posterior approach as (3), but pleura is lifted upwards out of the way and pleural cavity is not traversed.

The operation should aim to arrest hemorrhage and close as far as possible, the wound in the liver. Hemorrhage may be arrested by suture, by ligation of the larger vessels, by packing with gauze, and by actual cautery. Closure of the wound is difficult, due to the extreme friability of hepatic tissue. By the use of a thick suture on a Kousnetzoff liver needle (or some modification of it, such as Kader or Mikulicz) the edges of the wound may be approximated. If this fails, packing with gauze is the only possible satisfactory method. The gauze should be packed into the wound with sufficient firmness to arrest bleeding.

The cirrhoses of the liver are only occasionally subjected to surgery and then the results are often discouragingly indifferent or even deleterious.

Excluding the purely medical disease, syphilitic cirrhosis and the rare capsular cirrhosis, or perihepatitis, we may consider only two types as being of surgical interest, namely portal cirrhosis and biliary cirrhosis.

Laennec first described portal cirrhosis, although the effect of toxic substances going to the liver through the portal system had long been recognized. Alcohol had even then been accused of being the chief offender, and is only now losing some of this distinction. The one common feature of all types of cirrhosis is the increase in the connective tissue.

Briefly stated, virtual strangulation of the portal vein constitutes the reason for surgical intervention in portal cirrhosis. This intrahepatic blockage of the portal circulation imposes a tremendous vascular burden upon the liver. Observation of the physiological compensation for this, viz., the greatly increased collateral circulation, drew attention to possible surgical procedures.

1. Talma-Morison method to form new venous channels connecting the systemic and portal systems. This consists in scarifying the surfaces of the liver and spleen and sewing the omentum to the parietal peritoneum of the anterior abdominal wall.

2. Removal of the spleen. It is computed that in normal conditions one-seventh of the portal blood is derived from the spleen, but in cirrhosis, when the spleen is enlarged, it would impose upon the portal system an amount of blood far in excess of normal. Splenectomy would, therefore, reduce the volume of portal blood appreciably. The Talma-Morison operation can, of course, be performed concomitantly.

3. Eck's fistula—anastomosis between the portal vein and the inferior vena cava. Moynihan[30] says, "This is a procedure of which I have no experience, nor, I think, am I likely to have any."

Abdominal paracentesis is a palliative surgical procedure used repeatedly in the later stages of cirrhosis to relieve ascites—which almost invariably occurs. Attention should be called to the frequent occurrence of hemorrhage from varices, especially those of the oesophagus. McIndoe[32] reports this as the most frequent cause of death in portal cirrhosis.

In biliary cirrhosis the connective tissue deposits surround, not the venous radicles but the origins of the minutest bile passages within the liver. This type of cirrhosis is considered as originating in infections of the biliary ducts, which in the usual case arises in the gall bladder and especially in the infected and obstructed

common duct. Infection does not readily occur unless there is obstruction. The treatment of biliary cirrhosis of the average type, therefore, depends on the establishment and maintenance of thorough drainage of the biliary ducts. Another type of biliary cirrhosis may occur without infection, it being secondary to splenomegaly. W. J. Mayo[33] recommends splenectomy in this type of case.

Infections of the liver are of two types, non-suppurative and suppurative. Non-suppurative hepatitis is of no surgical interest *per se*. It, however, has a very definite bearing on the common surgical condition, cholecystitis, and may give rise to still another interesting condition, cirrhosis.

Heyd[34] feels that there is some degree of secondary hepatitis associated with every case of cholecystitis. Conversely cholecystitis may develop from a primary hepatitis, as has been shown by Graham.[35] Ample reason for this inter-relationship between the liver and gall bladder is seen by considering their lymphatic connections, which have been mentioned previously.

Suppurative hepatitis, or liver abscess, exists in three forms, traumatic, pyemic, and tropical (DaCosta[36]). Osler[37] adds two other types: 1. inflammation of the bile passages, and 2. foreign bodies and parasites.

Traumatic abscess usually results from an open wound of the liver, but may be caused by a subcutaneous contusion. In the former the infecting organisms are carried in by the injuring agent, or the abscess may form around some foreign body, as a wad of clothing or a bullet. The abscess following a contusion usually is the result of infection of a hematoma by blood or bile borne bacteria. Recovery usually follows incision and drainage of these traumatic abscesses.

Pyemic abscesses are usually multiple but may fuse into one large solitary abscess. These are usually due to portal pyemia as from suppurative appendicitis, or to lymphatic infection along the extrahepatic bile ducts. Infrequently they follow systemic disease, as measles or typhoid fever, and sometimes occur as extension from a perforated gastric ulcer. Since the pus from these abscesses is rarely, if ever, sterile, aspiration is not only dangerous but logically can do no good. The only method of treatment that should be employed is incision and drainage.

Tropical abscess of the liver is rare in temperate climates, but is extremely common in the tropics. Its usual antecedent in either climate is amoebic dysentery. Passive congestion of the liver is common among white inhabitants of the tropics, especially is it true of those who abuse alcohol. The amoeba, which has a widespread distribution, therefore, finds in the liver a nutritious soil for a fruitful infection.

In 70 per cent of cases the abscess is solitary[30] and in 15 per cent there are two large abscesses. In the remaining 15 per cent abscesses are multiple, and the dysentery is active, while with solitary abscess there are often no symptoms of dysentery. The right lobe alone is affected in 71 per cent of cases; the left alone in 16 per cent.

Signs and symptoms: Onset is usually slow. The patient suffers from languor, lassitude, irritability, and depression. He has headache, foul tongue, anorexia, and loss of weight. There may be slight diarrhea, but absence of symptoms of dysentery is not uncommon. Later there is chilliness and fever, especially in the evening, and soon thereafter a definite remittent fever becomes established. Fulness appears in the epigastrium, and liver dullness increases. There is tenderness over the right lobe of the liver. Jaundice is uncommon, but may occur. Leucocytosis is present. The finding of amoebae in the pus should not be expected, as they are usually only found in the scrapings from the walls of the abscess cavity. Skiagrams show the

dome of the diaphragm raised on the right side. Pannett[38] thinks exploratory aspiration is "safe" if, 1. the right lobe only is explored; 2. the needle is not of large caliber; 3. the right lobe is explored posteriorly and never through the anterior abdominal wall; 4. punctures are made, first, mid-axillary 9th intercostal space and then 8th space, and, second, posterior spacular line 10th intercostal space, then 9th space, but never a large number of promiscuous punctures; and 5. if one is always prepared to evacuate the abscess by open incision. Maes[39] has emphasized the use of an exploring needle of sufficient length to reach even the dome of the liver.

TREATMENT.

1. Conservative method consists of aspiration of abscess and injection of quinin or emetin into the cavity. Pannett[38] recommends this method in easily accessible cases. Talbot[40] recorded successful aspiration of 11 cases. After Rodgers[41] demonstrated that the pus in these abscesses was generally sterile, aspiration gained in favor and is now the accepted method of those whose experience is largest. It is necessary to completely evacuate the abscess at one aspiration. Perhaps emetine, or other amoebicidal substances, need not be injected into the cavity for healing appears to take place without them. However, emetine should be used subcutaneously. Indeed, success of this conservative method largely depends upon intensive treatment with emetine before aspiration of the abscess.[41]

2. Open operation should be done when aspiration has failed or the aspirated pus is found to contain pyogenic organisms and in all abscesses of the left lobe or any abscess bulging anteriorily. The operation may be accomplished through an abdominal incision, special care being taken to wall off the liver from the peritoneal cavity by gauze packs or by suturing the capsule to the parietal peritoneum. We should not be careless because we may feel that the pus is probably sterile. "No surgeon is entitled to assume that dirty work of any kind is harmless" (Moynihan). After a large area of liver is thus exposed in the bottom of the wound, the abscess may be opened, a cautery or small scalpel being used and the tract then being enlarged with the finger. The cavity may be packed tightly with gauze or a large drainage tube inserted. In general, the method by which the abscess is approached should be the most direct route possible. Resection of ribs may be necessary in order to reach the abscess, but the pleura should not be opened unless such a procedure is made imperative by the abscess having reached a high level, in which event the traversed pleural tract must be securely closed off from the general thoracic cavity before the abscess is opened.

Hydatid or echinococcus cysts of the liver are common in Iceland and Australia, but rare elsewhere. The favorite site is the right lobe. The signs or symptoms may be few in cases with small cysts or suggestive of a large tumor when the cysts are of greater size. Hydatid fremitus is a typical finding. Rupture may occur. Suppuration may likewise become a complication.

The cyst is surrounded by a fibrinous capsule composed of compressed liver tissue. The contents are clear, opalescent, non-albuminous fluid, scolices and hooklets.

Operative treatment offers the only means of relief. Aspiration and injection has been abandoned. "For cysts which are suppurating the method to be chosen is that of incision and drainage in one or in two stages: in one stage if adhesions are present between the liver and the abdominal wall; in two stages if no adhesions are present. If the cyst lies at or near the surface of the liver the method to be preferred is that of enucleation" (Moynihan[30]).

Malignant tumors of the liver are rarely primary, being secondary in 95 per cent of cases (Boyd[42]). Primary carcinomata of the liver compose .5 per cent of all cancers (Ewing[43]). (In the negro, carcinoma of

the liver is said to be somewhat more common[44].) In 85 per cent of the cases of primary malignancy there is an associated cirrhosis (Ewing[43]).

Primary carcinomata may be of two varieties, the one arising from the epithelium of the bile ducts, the other from liver cells. The former is more common. It is a columnar-celled adenocarcinoma, and is usually multiple. The liver-cell variety studs the liver with nodules so diffusely that the picture may resemble cirrhosis. Deep jaundice is a constant feature.

Sarcoma of the liver in the primary form is even rarer than carcinoma. By clinical history it cannot be distinguished from carcinoma, except that it may occur as a congenital or very early tumor in infants and children. However, it is also found in old age. Ewing[43] mentions seven collected cases.

Secondary malignancies of the liver are not infrequent, occurring 45 times more often than primary growths, and are chiefly metastases from neoplasms of organs drained by the portal vein. Another tumor which occasionally involves the liver, but less frequently than carcinoma, is hemangioma. It usually occurs in younger individuals, and is often associated with hemangiomata elsewhere in the body. As concerns surgery, Moynihan[30] records that he has "once removed a large haemangioma, twice has removed secondary growths which seemed to be solitary and lying near the edge of the liver, and which were easily accessible, and on five occasions has removed large sections of the liver with a gall-bladder that was obviously malignant. In all the malignant cases recurrence has taken place, the most delayed being first noticed four years and eight months after operation."

Syphilis of the liver, as elsewhere in the body, imitates with surprising accuracy the manifestations of other diseases. It is of surgical importance only because it may be accompanied by jaundice and symptoms of tumor. It may be congenital or acquired. The congenital type may cause cirrhosis, spots of fibrosis and miliary, or (occasionally) large gummata. Acquired syphilis may cause hepatic disease in the secondary and the tertiary stages. In the secondary stage there may be temporary jaundice, due to catarrh of the smaller intrahepatic bile ducts caused by inflammatory infiltration. Marked scarring may follow such envolvement. The tertiary lesions are most common. Gummata are the rule, and occur most frequently on the anterior surface of the right lobe (DaCosta[36]). A gumma adjacent to the common or the hepatic duct causes painless jaundice, and is often confused with cancer. As a gumma breaks down toxic or suppurative cholangitis may occur, accompanied by fever, chills, jaundice, and colicky pain. The history together with the blood and ascitic fluid Wassermann reaction suggests the diagnosis. Appropriate specific therapy will usually leave little doubt as to the presence of syphilitic infection.

(TO BE CONTINUED)

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COMMENTS ON TREATMENT OF HEART DISEASE.—J. B. Herrick, says: The great majority of heart cases are treated along these lines: Rest to permit recovery of muscular tone and to prevent overstrain of an injured organ. Digitalis to slow conductivity and heart rate and thus secure more rest, together with more vigorous ventricular contraction and more normal output of blood with each beat. Opium to relieve pain, induce sleep and lessen nerve strain. A laxative for purposes of elimination. There are occasional misapplications of the general principles. Consider the subject of rest. Fixed rules cannot and should not be laid down. There seems to be a wide difference in the practice of different physicians. Some prescribe too little rest for acute inflammation of the heart and for serious breakdown of a chronically diseased heart and, on the other hand, too much rest for milder grades of cardiac insuffciency and especially for cardiac disease with no evidence of present or impending breakdown. In general, an acute carditis demands rest until the temperature and pulse are normal and until moderate exercise does not cause the temperature to rise, the pulse to show undue irritability, or dyspnea to make its appearance. The patient with failing heart, whether from primary chronic valvular or myocardial lesion, needs rest long after his more urgent symptoms have disappeared. A too early resumption of work will promptly cause another breakdown. However, many physicians need to have removed the bugbear fear of exertion. It is not a new thought that the heart muscle after the subsidence of the acuter symptoms may, like skeletal muscles, need exercise; that what is needed in many instances is not less, but more exercise. Patients must be told that a rheumatic heart or a leaky valve does not necessarily imply a life of inactivity and idleness. Individualization is the key to this feature of treatment. There is a too strong tendency to impose on the profession arbitrary rules as to the use of digitalis, rules that are in part contradicted by the every day results of bedside practice. The fact that so many physicians successfully prescribe digitalis without thought of cat units, accurate body weight, or rate of elimination; that they use it in conditions other than auricular fibrillation; that they do not refrain in an urgent situation from giving it subcutaneously, intramuscularly or intravenously; that they very rarely feel compelled to give the massive dose in order to the the prompt effect, all this is a protest—an unconscious one, to be sure—against the too dogmatic directions that have been given publicity, directions that are perhaps too much based on laboratory experiment, with too little control by extensive bedside observation. The greatest fault, however, is the giving digitalis without any indication for its use except the diagnosis of heart disease—and this diagnosis sometimes wrong. Ignorance, haste, carelessness, indifference, too great reliance on the roentgen-ray or electrocardiograph will explain many cases. But often, Herrick believes, it is to be explained by the fact that the physician has heard from a teacher, or he has read in the medical journal that the early diagnosis of heart disease is the great desideratum. But he has not read of the errors in the diagnosis of heart disease. The mistake of diagnosing wrongly may lead to direful consequences, unnecessary fear, lives of inactivity, enormous economic loss. Again, when there is some real cardiac disturbance the greatest care is necessary not to convey a wrong impression. The impression of a disease is destined to advance relentlessly toward an early death. There is a danger not fully recognized that the movement for periodic health examinations will, unless most carefully watched, make people too introspective, too apprehensive. —J. A. M. A., 91:1761, 1928.

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CHRONIC APPENDICITIS.

There is a growing appreciation that the operations that have been performed in the past for so called chronic inflammation of the appendix do not in many cases relieve the symptoms for which the appendix was held culpable. This is shown particularly by the studies that have been made by surgeons from the results of a followup of patients who have been operated upon for many irregular and vague symptoms which have been thought due to a chronically diseased appendix. Carnett believes that many of these patients are suffering from intercostal neuralgia rather than inflammation of the appendix. It has been shown that 40 per cent of these patients are not improved by operation. Furthermore, such a well known surgeon as Hugh Cabot has demonstrated that among 300 patients unsuccessfully operated on for chronic appendicitis, 11.6 per cent were made definitely worse as a result of the operation. Incidentally the mortality rate of operations on the appendix has increased 31 per cent in the past two decades.

Surgeons have written most of the articles that have appeared in current medical literature and some few of the more enlightened ones have preached against the promiscuous removal of the appendix as a result of a diagnosis which is based upon a poke in the side and a history of indigestion. The medical man, as well as the surgeon, is now protesting against the wholesale removal of an organ, which while not in any sense vital or necessary to human economy, nevertheless is tucked away in a particularly sensitive portion of the anatomy. Bettmann* writes that the diagnosis of chronic appendicitis is one made with considerable difficulty, and it take close study and slow decision to arrive at such a conclusion. He calls particular attention to the fact that pathologists disagree as to what is really chronic appendicitis; that roentgenologists differ widely among themselves as to the roentgenologic diagnosis, one saying that a non-filling appendix is normal, another that it is a sign of disease, still others insisting upon tenderness as an important feature of the disease; and that surgeons are unwilling to study their patients thoroughly. He concludes that it is only after long and conscientious observation of the patient should he be submitted to surgical practices, procedures which might possibly cause death, which may never relieve the condition and which may ultimately make the patient worse than he was before the operation.

*Bettmann, Henry W.: Chronic appendicitis from the viewpoint of an internist. Ann. Int. Med., 2: 509, 1928.

PREVENTION OF INFLUENZA.

The prevention of influenza is, of course, "a consummation devoutly to be wished", in spite of the fact that it seems to call for a program of a most ambitious nature. Regardless of the size of the task, we are now face to face with the problem and there is no way for the medical profession to escape its responsibility, even though it were desirous of doing so. Without going into the bacteriology of this condition, regarding which too little is known, it may not be amiss to remind ourselves that we are dealing with an acute inflammation of the nares and pharynx accompanied by a systemic toxemia and that while the disease itself is not of a serious nature, the many complications are.

Whenever an epidemic of influenza begins to manifest itself, we find the lay press, as well as the professional, filled with a little of treatment and a great deal about predisposing causes. One will say that it is due to cold air blowing on you, another that it is due to an irritation in the atmosphere caused by insufficient ventilation, others speak of the food one eats playing a part.

This discussion is largely due to the fact that the terminology of the pathology of the upper respiratory tract is very inexact. The patient with a chronic inflammation of some of the accessory sinuses may have an exacerbation of his trouble following exposure but nobody would have us believe for one moment that this was the cause of the trouble. We know that some people have a metabolic rhinitis following dietetic indiscretion but there is no reason to confuse this condition with those of an infectious nature. Neither should those fleeting irritations due to chemical and mechanical agencies be confused with acute infections of the upper respiratory passages.

When we are dealing with other acute infectious diseases, such as scarlatina, typhoid fever, malaria, or diphtheria, we are not inclined to waste a great deal of time on what factors lower a person's resistance or what promote ones susceptibility, but with influenza we find the advice to avoid infection and to treat infection so befogged and overclouded by a mass of superstitions about the part played by exposure and ventilation and food that the main point is lost sight of.

By training ourselves better to differentiate between the various pathological entities to be found in the upper respiratory tract, we shall the sooner be able to separate the wheat from the chaff. As long as a metabolic rhinitis, a discharge from an infected sinus, a sneeze due to dust are called "colds", there will continue to be confusion in the profession as well as in the laity.

Surely the rhinolaryngologists have able enough pathologists in their ranks to provide a nosology that should go far to clear the situation.

When the medical mind definitely differentiate the acute infections that attack the upper respiratory passages from the other inflammations of various origins, it will naturally cease to bother about the effect of cold air and bad air and bad water and excess of food. The profession will then begin to treat these infections as they have learned to treat acute infections in other parts of the body.

Gorgas made it possible for the jungle to be cleared so that Goethals could dig the canal. If we shall be enabled to clear the confusion by getting a better nosology we shall make almost as much progress as we shall when we finally learn the name of the organism that causes influenza.

Let us not think so much of predisposing causes and think more of the immediate cause.

Let us be as careful in preventing the spread of infection for influenza as we are with such diseases as diphtheria and scarlatina.

If we can keep our patients isolated until they no longer discharge the organism from the nose and throat, we shall cease to have epidemics of influenza.

PRESIDENT FENNER.

The new President of the Orleans Parish Medical Society, Eramus Darwin Fenner, M. D., who was installed as President of the organization on Monday, January 14, was born in New Orleans in 1868. He received the B. A. Degree from Tulane University in 1888, and after spending a year at the University of Virginia, entered the Medical School of Tulane to graduate in 1892. During the last two years of his medical course he was associated with the Charity Hospital as an interne. Dr. Fenner has served on the Visiting Staff of this great hospital from 1892 to the present date, and for the period of 1898 to 1905 was first Assistant House Surgeon. He has been connected with Tulane Medical School since 1895. During the first ten years of his attachment with the University he lectured on the diseases of children. From 1904 until 1907 he was Professor of Surgical Diseases of Children, and for the next twenty years ably and successfully conducted the Department of Orthopedics and Surgical Diseases of Children, becoming Emeritus Professor of Orthopedics in 1927.

The new president of the Parish Society spent nearly two years in the Army. One of the earliest men called to duty from New Orleans, he reported August 31, 1917, as Orthopedic Surgeon of Base Hospital Number 24. After spending some months in this country, he went overseas on February 15, 1918, saw active service in France and was honorably discharged in this country April 24, 1919.

Dr. Fenner has been always an energetic worker in the Orleans Parish Medical Society. In addition to his membership in this organization, he is a member of the Louisiana State Medical Society, American Medical Association, American College of Surgeons, as well as a member of the Louisiana Governing Committee of the Gorgas Memorial. Dr. Fenner was happily married on April 18, 1920, to Sadie Cameron McDonald.

The Orleans Parish Medical Society is to be congratulated upon its selection of Dr. Fenner as President. A man of delightful and charming personality, of force and character, a scholar and a sincere student of literature, he brings to the presidential chair attributes of initiative, dignity, and absolute integrity, which will do much to advance the interest of the organization and to make him a splendid presiding officer.

CAPITAL INVESTMENT IN MEDICINE.

Elsewhere in this issue is a copy of a letter sent to Dr. T. M. Dye, Secretary of the Mississippi State Medical Association, and to Dr. P. T. Talbot, Secretary-Treasurer of the Louisiana State Medical Society, by the Director of Study, R. G. Leland, M. D. This notice concerns a questionnaire sent out by the American Medical Association for the purpose of securing data that may throw some light on the capital investment of the individual physician. This information should be of the utmost value and interest to all physicians and it is to be hoped that all will co-operate with the American Medical Association in this undertaking.

HOSPITAL STAFF TRANSACTIONS

CHARITY HOSPITAL MEDICAL STAFF MEETING.

MEETING DECEMBER 18, 1928

Dr. Chaille Jamison presented the clinical case history of a case of myelogenous leukemia in a colored male, and an autopsy was performed on the case, the meeting having adjourned to the autopsy room for this purpose. Dr. D'Aunoy conducted the autopsy and described the pathological findings. The case was typical in all respects, and was of added interest because it had not been benefitted by the use of radium.

Dr. Herrmann demonstrated the action of the heart valves in the case, by means of water pressure with in the heart.

WILLARD R. WIRTH, M. D.

STAFF MEETING VICKSBURG SANITARIUM AND CRAWFORD STREET HOSPITAL.

DECEMBER 10, 1928 SPECIAL

CASE REPORTS.

Carcinoma of the Stomach; Sleeve Resection.—

DR. A. STREET

The patient, a white male, aged 69 years, a widower, by occupation storekeeper, came to clinic August 4, complaining of pain in epigastrium which radiates over entire abdomen. He has been having similar attacks for thirty years. Between attacks he eats well and food agrees with him. Attacks are accompanied by vomiting but no hematemesis. The bowels are constipated; at time of examination had not moved but slightly for six days. There was no marked loss of weigh and no fever. He gets up twice at night to void urine; has had bladder operation some years ago. Family history has no bearing on the case. The examination disclosed a fairly well nourished, not feeble, male. Pulse, 60; respiration, 18; systolic blood pressure, 150. The teeth show pyorrhea and caries; while the tongue is dry and rough, and the palate rough with mosaic arrangement of rectangles with red centers; tonsils atrophied. Liver edge slightly low and hard; not tender. Physical examination otherwise not remarkable.

The roentgenogram examination showed multiple small gall stones and cylindrical narrowing of distal two-thirds of stomach.

The leukocyte and differential leukocyte counts were normal; no malaria; Wassermann and Kahn tests negative.

An exploratory laparotomy was advised but refused at the time. The patient was re-admitted to hospital October 23. He had had hamatemesis a few weeks after first examination.

Operation: Under ether and gas anesthesia, a high incision slightly to right of median line was made. The gall bladder was pale, thickened, and contained several stones. Stomach was narrow, resembling "leather bottle" in shape but not in appearance. On posterior wall, along greater curvature, was extensive growth so far to left that operability was questionable. However, clamps were placed behind growth and distal to it and trans-gastric-resection accomplished with end to end anastomosis. Gall bladder was not disturbed. Wound closed with silk worm twist drain of wall of abdomen.

The microscopic examination showed adenocarcinoma (group IV); ulceration; acute and much chronic inflammation; much fibrosis; growth apparently limited to muscosa and sub-mucosa. Node from lesser omentum showed chronic inflammation but no cancer.

Patient has had an uneventful convalescence and was discharged from hospital November 16.

ENDEMIC TYPHUS FEVER IN THE UNITED STATES.—Recent work by officers of the U. S. Public Health Service in connection with studies of endemic typhus fever in the United States is of much interest.

The data which are available from morbidity reports, from the literature, and from field investigations give only a hare outline of the occurrence of this typhus-like disease in the United States. So far as information is available, it seems to indicate that the disease is rather sharply limited to the Atlantic seaboard and the near-by Piedmont section, going as far north as Boston. It is present in nearly all of the seaports from New York southward and has attained widest distribution in Alabama, Georgia, and Florida. On the Gulf coast, while it has been reported from Tampa, Pensacola, Mobile, Galveston, and Houston, there is at present no information regarding its occurrence in Mississippi or in Louisiana. The lower Rio Grande Valley from Laredo to Mercedes constitutes an important focus. On the Pacific coast only Los Angeles has reported a considerable number of cases. While an occasional case has been reported from the interior of the country, that section has been for the most part strikingly free.—U. S. Public Health Service.

TRANSACTIONS OF ORLEANS PARISH MEDICAL SOCIETY

During the past month there was a joint meeting of the incoming and outgoing Boards of Directors, and the Society held its Annual Installation Meeting and a joint meeting with the New Orleans Gynecological and Obstetrical Society.

At the Installation Meeting the program was as follows:

Annual Report of Secretary:
Dr. H. Theodore Simon.

Annual Report of Treasurer:
Dr. John A. Lanford.

Annual Reprt of Librarian:
Dr. Daniel N. Silverman.

Annual Reports of Special and Standing Committees.

Annual Report of Going-Out President:
Dr. J. Birney Guthrie.

Address of Incoming President:
Dr. Erasmus Darwin Fenner.

"Judging the Quick and the Dead."
By Judge Wm. W. Westerfield, Annual Orator.

Installation of the following Officers:
President—Dr. Erasmus Darwin Fenner.
First Vice-President—Dr. C. Grenes Cole.
Second Vice-President — Dr. Frederick L. Fenno.
Third Vice-President—Dr. Adolph Jacobs.
Secretary—Dr. H. Theodore Simon.
Treasurer—Dr. John A. Lanford.
Librarian—Dr. Daniel N. Silverman.

Additional Members Board of Directors—Dr. P. Graffagnino, Dr. J. Birney Guthrie, Dr. Wm. D. Phillips.

At the joint meeting with the New Orleans Gynecological and Obstetrical Society, held January 28, the program was as follows:

The Obstetrical Patient.

a. Prenatal Care.

b. Management of Labor. (Motion pictures)
   1. Normal Labor.
   2. Forceps.
   3. Version and Breech Extraction.
   4. Cervical Type, Cesarean Section.

By: Dr. Carl Henry Davis, Milwaukee, Wisconsin, Chairman, Section on Obstetrics, Gynecology and Abdominal Surgery, A. M. A.

Dr. Suzanne Schaefer was elected to Active Membership, and Dr. S. L. Tiblier was elected to Associate Membership.

REPORT OF TREASURER.

Actual Book Balance 11/30/28	$1,960.31
Receipts during December	1,973.77
Receipts for insurance	1,052.65
	$4,986.73
Expenditures	$3,746.79
Actual Book Balance: 12/31/28	$1,239.94

REPORT OF LIBRARIAN.

Fifty-eight books have been added to the Library during December. Of these 6 were acquired by subscription, 43 by gift and 9 from the New Orleans Medical and Surgical Journal. This brings the number of volumes in the Library on December 31st, 1928, to 13,790. A notation of new titles of recent date is appended herewith.

NEW BOOKS.

Osler—Modern Medicine. v. 6 and Index.

U. S. Public Health Service—Annual Report. 1928.

Phillips—Diseases of the Ear, Nose and Throat. 1928.

Joslin—Treatment of Diabetes Mellitus. 1928.

Gould—Pocket Medical Dictionary. 1928.

Keyes—Urology. 1928.

Speed—Fractures and Dislocations. 1928.

Hall—Ultra-Violet. Rays. 1928.

H. THEODORE SIMON, M. D.,
Secretary.

LOUISIANA STATE MEDICAL SOCIETY NEWS

H. Theodore Simon, M. D., Associate Editor.

PARISH MEDICAL SOCIETY OFFICERS FOR 1929.

The following Parish Medical Societies have elected officers for 1929 as follows:

Ouachita Parish:

President—Dr. P. L. Perot, Monroe.

Vice-President—Dr. J. T. French, Monroe.

Secretary-Treasurer—Dr. E. R. Yancey, Monroe.

LaSalle Parish:

President—Dr. C. W. Patterson, Tullos.

Vice-President—Dr. J. P. Durham, Trout.

Secretary-Treasurer—Dr. W. V. Taylor, Olla.

Delegate—Dr. W. V. Taylor, Olla.

Alternate—Dr. John M. Kittrell, Good Pine.

Claiborne Parish:

President—Dr. M. J. Rivenbark, Haynesville.

Vice-President—Dr. E. O. Bond, Homer.

Secretary-Treasurer—Dr. E. B. Middleton, Homer.

Delegate—Dr. J. W. Featherstone, Homer.

Alternate—Dr. C. O. Wolff, Haynesville.

Richland Parish:

President—Dr. G. E. McConnell, Manghum.

Vice-President—Dr. Nash Collins, Delhi.

Secretary-Treasurer—Dr. J. C. Sartor, Rayville.

Avoyelles Parish:

President—Dr. Emil Regard, Mansura.

Vice-President—Dr. R. G. Ducote, Bordelonville.

Secretary-Treasurer—Dr. Kirby A. Roy, Mansura.

Delegate—Dr. S. J. Couvillon, Moreauville.

Iberia Parish:

President—Dr. Guy A. Shaw, Loreauville.

Vice-President—Dr. Geo. J. Sabatier, New Iberia.

Secretary-Treasurer—Dr. P. A. Boykin, Jeanerette.

Delegate—Dr. Guy A. Shaw, Loreauville.

Alternate—Dr. P. A. LeBourgeois, New Iberia.

St. Landry Parish:

President—Dr. Lionel J. Bienvenu, Opelousas.

Vice-President—Dr. J. N. Brown, Washington.

Secretary-Treasurer—Dr. Wilson W. Knowlton, Opelousas.

Delegates—Dr. Geo. Beridon and Dr. S. B. Wolff, Opelousas.

Alternates—Dr. Oscar Bienvenu, Opelousas, and Dr. R. G. Hawkins, Palmetto.

THE BIRTHDAY EXERCISES OF THE PRESBYTERIAN HOSPITAL.

On January 23, 1929, at 3 P. M., under the Auspices of the Women's Auxiliary, the Presbyterian Hospital of New Orleans celebrated with appropriate and fitting exercises, its birthday, in completion of twenty-one years of continuous service.

Many interesting features were involved in this celebration. The Class of 1929, of the Training School for Nurses, received their diplomas at the hands of Dr. J. C. Barr, President of the Presbyterian Hospital. The annual address to the graduating class was delivered by Dr. James Madison Batchelor, Surgeon in Chief of the Presbyterian Hospital.

An interesting address was delivered by Dr. John N. Lindner, President of the Clinical Society of the Presbyterian Hospital.

A prayer was offered by the Rev. Dr. F. H. Ford, pastor of the Community Presbyterian Church, Jefferson Terrace, New Orleans, and a reading from scripture was given by the Rev. L. E. Koenig, Pastor of the Andrew Jackson Presbyterian Church, New Orleans. The Hospital had as its distinguished and honored guests, the Rev. Dr. Lewis S. Mudge, the Stated Clerk of the General Assembly, and Dr. James H. Speer, of the General Council of the General Assembly of the Presbyterian Church, U. S. A., who brought a message of closer fellow-ship and encouragement from the constituency of this great Church.

In addressing the assembly, Dr. Barr, President of the Hospital, sketched an outline of the institution from its humble beginning twenty-one years ago, through its trials and difficulties, to its present plant, ranking the Presbyterian Hospital of New Orleans with the great institutions of the country. Particular mention was made of the recent dedication of the James M. Batchelor Building, the first unit of the proposed New Presbyterian Hospital. This building, designed for the use of the medical profession, classically simple in the beauty of its structure, will be followed in the immediate future by the erection of the second unit of the proposed group of buildings, on the Hospital's property, facing Baronne Street.

Appreciation was expressed to those of the profession who had given so liberally of their time and skill to the upbuilding of the institution, and to the many friends who by their co-operation have assisted the Hospital in its progress.

A delightful tea was served after the exercises, affording the guests refreshment, and an opportunity to meet each other and further enjoy the occasion.

A LETTER OF FORTY YEARS AGO.

New Orleans, May 26, 1888.

To His Excellency, James Jeffreys, Lieutenant Governor of Louisiana and President of the Senate, and to the Hon. S. P. Henry, Speaker of the House of Representatives:

. . . . In the annual report for 1887, the Administrators of the Charity Hospital, through their presiding officer and also through their house-surgeon, strenuously urge that the restriction (none but resident Louisianians be admitted as resident students) has proved detrimental to the interests of the hospital and the best care of the sick.

Also in 1887, the State Medical Society, the only organized representative of the reputable physicians of Louisiana, adopted resolutions earnestly protesting against this restriction as "unwise and illiberal." Surely it is inconsistent with the humane and noble creed of the universal brotherhood of man; a creed which rejects limitation by State lines, which has ever found sustenance in the deeds as well as in the heart of the medical profession, and which, if it merits any observance, deserves it especially in all matters which concern the sick and the afflicted.

Many of the physicians of this State have enjoyed, many will hereafter enjoy, the privileges of hospitals in other States, and even in foreign lands, as freely as if citizens thereof. To these particularly, but also to all citizens of liberal culture, it is a just cause for keen mortification that Louisiana should have arrayed itself by an invidious restriction against the comity of other States and nations, and thus invited these to retaliation.

Our State has heretofore been distinguished for notable liberality in all things appertaining to the sick, the dead, and the medical profession; never until 1886 had its Legislature imposed any illiberal restrictions on the government of the Charity Hospital. Its management was left, where it is wisest it always should be left, in the hands of the administrators selected because of their superior knowledge of hospital affairs and their special fitness to fulfill all the duties of their position.

Hence, we respectfully, but most earnestly, petition the present General Assembly to follow, in this matter, the example of every one of its predecessors *except the last one*, and to leave the internal management of the Charity Hospital to its administrators, designed by law and specially chosen by the Governor and the Senate for this very purpose.

Yours very respectfully,

STANFORD E. CHAILLE, M. D.

WILLEY DENIS, A. M., PH.D.

On Wednesday, January 9, 1929, the very sad death of Dr. Denis occurred after a long illness of more than a year's duration. Although not a physician, Dr. Denis for many years had come in intimate contact with the medical profession. She taught the Harvard medical students for some years, while the later years of her life had been spent in instruction of the Tulane medical students.

The loss of Dr. Denis is a severe one, not only to Tulane Medical School, but also to the City of New Orleans, the State of Louisiana and the medical profession throughout the country. One of the great scientists in the United States, Dr. Denis had done tremendous amount of valuable research work which has benefitted all medicine; and each and every medical man is indebted to her in part for many of the laboratory methods that are now in daily use. Dr. Denis stood in the forefront of science, and science will feel deeply her loss. She was undoubtedly one of the great woman scholars of the world. Certainly her accomplishments, her name and her reputation were greater than that of any woman scientist of the South.

There is a splendid opening for a young physician at Tallulah, Louisiana. Any one interested please communicate with Mr. R. M. Almond, Tallulah, La.

UNITED STATES PUBLIC HEALTH SERVICE.

A. A. Surgeon J. G. Wooley is directed to proceed from Carville, La., to Kansa City, Mo., to take into custody patient and accompany him to Carville, La.

VITAL STATISTICS.

During the year 1927 in the State of Louisiana there were 23,875 deaths from all causes, exclusive of still births, which contrasts with 24,230 in 1926. The rate per one thousand population was 12.3. The death rate among the white race for 1927 was 9.5, with a total of 11,878 deaths, and the colored 17.4, the total number of deaths being 11,997. This rate per one thousand population

compares very favorably with that of other southern states. The rate in the registration states from the South shows that the rate was lower in Alabama and North Carolina. In other southern states it was higher than that of Louisiana.

DEATHS REPORTED FROM INFLUENZA AND PNEUMONIA WEEK ENDING DECEMBER 29, 1928.

In the City of New Orleans 53 deaths were reported from influenza and 44 from pneumonia, as compared with 37 the week previously from influenza and 22 from pneumonia.

During the week ending January 5, deaths from pneumonia in New Orleans were 44, from influenza 84. This explains the high death rate, namely: 48.1 during this particular week in the city.

THE DEATH RATE OF MOTHERS FROM CHILD BIRTH IN 1927.

In 1927, 420 women died from puerperal cause. Two hundred and one of these were white, 219 were colored. One hundred and sixty-four of these deaths were caused from peurperal septicemia, 76 among the white and 88 in the colored race. The death rate from puerperal cause per one thousand live births in 1927 was 9.1. These figures compare unfavorably with other states. In Kentucky the rate was 4.9, North Carolina 6.6, Tennessee 7.1, Virginia 6.2, Missouri 6.7, to mention a few of the southern states. In Wisconsin the rate was 5.3, Minnesota 4.4, Maine 8., New Jersey 6.3, picking at random a few of the other states in the country.

HEALTH OF NEW ORLEANS.

The United States Weekly Health Index for the year 1928 shows that in New Orleans the total deaths during the year were 8,147, of which 4,848 were white and 3,299 were colored. During the year 1927 there were 7,942 deaths, with the death rate of 18.7. This is a high death rate, higher than nearly any other city in the United States; but in explanation of these high figures it must be taken into consideration the fact that a large number of people are brought into the Charity Hospital from the surrounding towns and cities, many of which are many miles distant and they are brought only when in extremis. As a result of this practice a large number of deaths occur in the Charity Hospital of people who do not belong to the City of New Orleans, swelling very materially the death rate of the city.

DISPOSAL OF FARM SEWAGE.

Farmers' Bulletin No. 1227-F, entitled "Sewage and Sewerage of Farm Home," reissued recently by the United States Department of Agriculture warns against the dangers to human health and to livestock of negligence in properly caring for all forms of farm sewage.

Details and illustrations are given for construction of approved privies, chemical closets and septic tanks. Suggestions are also made for the proper placing of them on farms so they will not drain toward wells. The use of disinfectants and deoderants is also explained.

Proper care of the kitchen sink drainage is urged and illustrations show methods of disposal. The placing and construction of cesspools and grease traps are also discussed. Methods and details of construction are explained and illustrated in such a way as to be understood by homeowners.

Copies of the bulletin may be obtained by application to the Office of Information, United States Department of Agriculture, Washington, D. C.

On December 18, 1928, Dr. Allan C. Eustis, Professor of Clinical Medicine with the Graduate School of Medicine of the Tulane University of Louisiana, addressed the annual meeting of the East Mississippi Medical Society at Meridian, Miss., on "Myocardial Insufficiency; Diagnosis and Treatment."

TO THE MEMBERSHIP.

The work of the special Committees has been assigned, and the arrangements for the Annual Meeting are in full sway. It has been decided to hold the exercises in memory of our deceased members at the opening session on Tuesday, April 9.

The entertainment which will feature the celebration of the Fiftieth Anniversary of the Society will take place Tuesday evening at 8:00 o'clock in the Tip Top Inn of the Roosevelt Hotel. This promises to be a gala affair, and the Committe hopes that the attendance on that occasion will be record breaking. The profession of the State, their friends and the general public are invited to this function. Our President, Dr. Menville, has appointed the following Reception Committee to serve for this occasion, and urges that they all be present: Drs. Wm. Harris, H. Bernadas, Jerome Landry, Amedee Granger, Octaves Cassegrain, C. G. Cole, Wm. D. Phillips, Alton Ochsner, J. H. Musser, Harry Nelson, Louis Levy, J. E. Isaacson, Lucien LeDoux, J. M. Bachelor, Henry Bayon, Jr., all of New Orleans;

S. B. Wolff, Opelousas; J. W. Faulk, Crowley; H. P. St. Martin, Houma; H. C. Dansereau, Labadieville; S. C. Barrow, Shreveport; C. P. Gray, Monroe; G. M. G. Stafford, Alexandria; R. O. Simmons, Alexandria; L. J. Williams, Baton Rouge; Frank Gouaux, Lockport; D. C. Iles, Lake Charles; Chas. Gelbke, Gretna; H. B. Gessner, New Orleans; C. A. Weiss, Baton Rouge; C. C.. DeGravelles, Morgan City.

The Committee has not yet decided what kind of entertainment it will have Wednesday evening, April 10, but it will be a stag affair and in keeping with the traditions of the past, and your Committee promises to those who will be present a most enjoyable evening.

We beg to announce that clinics will be arranged for Monday, April 8. These clinics will be of a general nature, and there will be also special clinics under the auspices of the Dermatological Society.

DR. PAUL J. GELPI, Chairman,
Committee on Arrangements.

A NOVEL CATALOGUE.

A recent mail brought to us a Pharmaceutical catalogue which to say the least is striking and unusual. It is the new 1929 list of the Mulford Laboratories and is a radical departure from the usual run of price lists. It employs the modernistic style throughout and taking advantage of photography to reproduce unusual effects, a series of colored inserts has been prepared and used to mark the various divisions of the Mulford line.

Copies may be had by addressing H. K. Mulford Company, Philadelphia, Pa.

Dr. Homer Dupuy and Dr. Lucien A. LeDoux of the Hotel Dieu Staff, New Orleans, attended a recent meeting of the Tri-State Medical Society, which was held in Texarkana, Texas.

Dr. Homer Dupuy read a paper on:

"The Marked Viewpoint of Nasal Sinus Diseases, with Lantern Slides."

Dr. Lucien LeDoux read a paper on:

"The Method of Surgical Treatment of Uterine Displacements."

MEETING OF ST. TAMMANY PARISH MEDICAL SOCIETY.

The annual banquet and meeting for installation of officers was had Thursday night, January 17, at 8:00 P. M., at Behac's, a place of note for its splendid cuisine, at Mandeville. Doctors Gautreaux, Bullock, Buquoi, Young, F. F., Young L. Roland, Maylie, Payne, Griffith, Polk and Singleton answered the roll call. Doctors R. C. Young of Shreveport and Lawrence R. Young, formerly of Rayne, were guests.

Dr. F. F. Young, on relinquishing his chair as President to L. Roland Young, thanked the members for their assistance during his tenure of office and referred to the advances in the various branches of medicine to what it was thirty years ago, and urged all to stand banded together under the banner of organized medicine that all may go well and progress continue.

Dr. Maylie was declared elected at the last meeting as delegate by error, he being already councilor of the Sixth District, and in his stead was elected Dr. J. K. Griffith and Dr. H. D. Bullock alternate.

The banquet was enjoyed by all and the delicious food was served in courses and possessed that flavor unique of Bachac's.

By motion of Dr. F. F. Young the next meeting will be held at Slidell on the second Friday night of February, at 8:00 P. M.

L. ROLAND YOUNG,
Acting Secretary.

LEPROSY IN UNITED STATES.—Hopkins and Denney have made a statistical study of 718 lepers hospitalized over a period of thirty-four years in the Louisiana Leper Home—later the National Leprosarium. Two hundred and fifteen were foreign born and 503 were natives of the United States. The present population of the hospital is 287. Mexico, China, Italy, Greece and the Philippine Islands have furnished one-half of the total foreign born. Most of the lepers came from Louisiana, California, New York, Texas and Florida; 418 came from Louisiana. The incidence of leprosy among the white population of Louisiana is computed as twice that in the negro population. Of the total cases, 11.0 per cent were of the nerve type, 39.1 per cent of the skin type, and 49.9 per cent of the mixed type. Of the total cases, 72.3 per cent were in males and 27.7 per cent in females. The social status of the patients represents a cross-esection of the normal populace. The average age at onset of the disease is computed as 30.2 years; the average age on admission to the hospital was 36 years, with an average period of six years prior to admission during which each patient may have been a menace to public health. In a group of 100 Louisiana lepers, hospitalized more than fifteen years ago, it has been disclosed from subsequent records that in sixty-four instances only one leper in the family developed the disease, while in the thirty-six other instances leprosy occurred in eighty-three additional relatives. In some families the disease has invaded certain branches to the point of extermination.—J. A. M. A., 92:191, 1929.

MISSISSIPPI STATE MEDICAL ASSOCIATION NEWS

J. S. Ullman, M. D., Associate Editor.

The annual meeting of the East Mississippi Medical Society, which embraces the counties of Newton, Neshoba, Winston and Lauderdale, was held in the Elks' Club of Meridian, December 18, 1928, when officers for the ensuing year were elected, as follows:

President: T. E. Jarvis, Newton.

Vice-Presidents:

Lauderdale: T. L. Bennett.
Newton: W. S. Polk.
Neshoba: A. L. Majure.
Winston: T. F. Kilpatrick.

Censors:

Lauderdale: H. F. Tatum.
Newton: S. A. Majure.
Neshoba: J. S. Heckman.
Winston: O. F. Parkes.

Delegates:

Lauderdale: S. H. Hairston
Newton: H. McMullen.
Neshoba: C. H. Harrison.
Winston: W. W. Parkes.
Secretary-Treasurer: J. E. Anderson.

Their program was:

1. "Acute Osteomyelitis"—J. S. Speed, Memphis.
2. "Constipation"—James S. McLester, Birmingham.
3. "Surgery of the Infected Joint"—J. T. O'Ferrall, of New Orleans.
4. "Myocardial Insufficiency"—Allan Eustis, New Orleans.
5. "Fractures of the Neck of the Femur"—Samuel R. Benedict, Birmingham.

Dr. W. R. May has assumed charge of the Public Health Unit of Lincoln County with headquarters in Brookhaven.

The Staff meeting of the Vicksburg Sanitarium was held January 10, at which time the following cases were discussed:

1. "Poliomyelitis Occurring in an Adult during the Fourth Month of Pregnancy; Normal Baby Delivered at Term"—Dr. G. M. Street.
2. "Inflammatory Stricture of Sigmoid. Obstruction; Resection"—Dr. A. Street.
3. "Pyloric Stenosis"—Dr. J. A. K. Birchett.
4. "Achylia Gastrica"—Dr. L. J. Clark.
5. "Influenza"—Dr. Hugh H. Johnston.
6. "Sinusitis in Children"—Dr. Edley H. Jones.
7. Radiographic Studies.
   1. Pulmonary Tuberculosis.
   2. Pott's Disease of Lumbar Spine.
   3. Aneurism of Aorta.
   4. Thoracic and Abdominal Aneurism of Aorta in same patient.
   5. Sarcoma of the Mediastinum (follow-up).
   6. Carcinoma of the Pelvis, Spine, and Femur, Metastatic.

The North-east Mississippi Thirteen Counties Medical Society met in Starkville on December 18, 1928, at which time the following officers were elected for the ensuing year:

President: J. R. Hill, Corinth.

Vice-Presidents:

Alcorn: M. H. McRea.
Calhoun: J. B. Shaw.
Chickasaw: V. B. Philpot.
Clay: F. P. Ivy.
Itawamba: John Senter.
Lee: R. B. Pegram.
Lowndes: C. E. Lehmberg.
Monroe: J. A. Dilworth.
Noxubee: E. M. Murphy.
Oktibehha: F. B. Long.
Pontotoc: Z. A. Dorsey.
Prentis: R. B. Cunningham.
Tishimingo: K. F. McRae.
Secretary-Treasurer: J. M. Acker, Jr.

Delegates:	Alternates:
Alcorn: C. W. Norwood	S. L. Stephenson
Calhoun: W. J. Aycock	E. B. Young
Chickasaw: J. W. Williams	V. B. Philpot
Clay: A. K. Naugle	F. P. Ivy
Itawamba: E. B. Nabors	John Senter
Lee: L. C. Feemster	L. C. Spenser
Lowndes: W. L. Stalworth	J. W. Cox
Monroe: J. M. Acker, Jr.	M. Q. Ewing
Noxubee: A. R. Saunders	C. W. Saulter
Oktibehha: C. B. Mitchell	C. R. Dabbs
Pontotoc: R. P. Donaldson	O. F. Carr
Prentiss: L. L. McDougall	W. H. Anderson
Tishimingo: A. E. Bostick	C. Croemeans

Their program was as follows:

1. "Herpes Zoster Ophthalmica Associated with Acute Parotitis"—Dr. D. E. Staton, Columbus
2. "Perineal and Cervical Repair"—Dr. M. Q. Ewing, Amory

3. "Gastro-Intestinal Disturbances" — Dr. H. G. Rudner, Memphis

4. "Some of Our Professional and Associational Needs"—Dr. W. H. Frizell, Brookhaven

5. "A Paper"—Dr. L. A. Crosby, Aberdeen

During the recent epidemic of influenza in Laurel the following physicians were ill from that disease: Drs. J. S. Gatlin, J. F. Scarborough, T. R. Beech, R. H. Foster and H. S. Tucker.

The South Mississippi Charity Hospital at Laurel has resumed the admission of patients but no visitors have been allowed.

At the last quarterly meeting of the South Mississippi Medical Society held at Laurel on December 13th, the following officers were elected for 1929.

President: Dr. R. H. Foster, Laurel.

1st Vice-President: Dr. H. P. Smith, New Augusta.

2nd Vice-President: Dr. T. R. Beech, Ellisville.

Secretary-Treasurer: Dr. J. H. Newcomb, Richton.

Delegates:

Covington: G. T. Cranford.
Forrest: H. L. McKinnon.
George: R. F. Ratcliff.
Green: M. M. Magee.
Jasper: A. M. Haralson.
Jeff Davis: G. C. Terrell.
Jones: R. H. Cranford.
Lamar: G. D. Mason.
Marion: J. G. Gardner.
Pearl River: R. W. Stewart.
Smith: J. O. Cargile.
Perry: J. E. Green.

Their program was as follows:

1. "Eczema"—Dr. R. W. Hall, Jackson.

2. "Artifical Feeding of Well Babies"—Dr. C. G. Wright, Hattiesburg.

3. "Newer Methods of Treating Syphilis of the Nervous System"—Dr. C. H. Holbrook, New Orleans, La.

The first quarterly meeting of the Homochitto Valley Medical Society was held in Natchez on January 10 with Dr. W. H. H. Lewis in the chair.

Under clinical cases one of polyneuritis probably due to arsenic poisoning was discussed by Dr. R. D. Sessions.

Papers were presented as follows:

1. "Fracture of the Atlas"—Dr. J. S. Ullman.

2. "Ainhum"—Dr. Marcus Beekman.

Dr. B. D. Blackwelder, formerly director of the Public Health United of Holmes County, has moved to Natchez where he has taken charge of the Public Health Unit of Adams County.

The regular monthly meeting of the Issaquena-Sharkey-Warren Counties Medical Society was held jointly with the Central Medical Society at Jackson on January 15. Their program was as follows:

1. "Cancer of the Stomach"—Dr. A. Street.

2. "Paranasal Sinusitis in Children"—Dr. E. H. Jones.

3. "Infections of the Hand"—Dr. S. W. Johnston.

The Inter-State Post Graduate Medical Association of North America announces the preliminary program for the American Spring Assemblies, April 15-May 9, 1929, to include visits to clinics at Rochester, Chicago, Cleveland, Boston, New Haven, New York, Philadelphia, Baltimore and Washington.

The foreign Assemblies are announced for May 18 to July 11, 1929 and will include visits to clinics in London, Glasgow, Edinburgh, Oslo, Stockholm, Upsala, Lund, Copenhagen, Hamburg, Berlin, Frankfort, and Paris.

Dr. W. B. Peck, Freeport, Illinois, is the managing-director and may be addressed for any information regarding these assemblies.

CAPITAL INVESTMENT IN MEDICINE.

The following letter which was recently received by Dr. Dye should interest every physician in Mississippi.

January 5, 1929.

Dr. T. M. Dye, Secretary,
Mississippi State Medical Association,
Clarksdale, Mississippi.

Dear Doctor Dye:

As you receive this letter, the questionnaires on The Capital Investment in Medicine will be ready to leave the headquarters of the American Medical Association. A very important group, composed of economists, publicists, physicians and others, has undertaken to make an investigation of the cost of medical care, the results of which will be of great importance to medical profession. The American Medical Association has under-

taken to collect information pertaining to the capital investment in medicine and the income from medical practice.

As a part of the work of the above-mentioned group, known as the Committee on the Cost of Medical Care, the American Medical Association is to request more than 25,000 physicians, selected at random, to furnish certain data pertaining to the invested capital involved in physicians' education, intern training, post-graduate courses, office and traveling equipment, office maintenance, medical society affiliations, library maintenance and medical licensure fees.

This, as you will realize, is a survey of the profession, and for the benefit of the profession. The questionnaire is to be anonymous and, therefore, there need be no fear of any embarrassing or undesirable results from the information returned.

You are urged to encourage, among the members of your state society, a serious and thoughtful consideration of this matter to the end that complete and reliable data will be given on the several items. We desire that you suggest, through your medical journal, by news item, editorial and other appropriate means, the importance of this survey and the desirability of universal participation on the part of the physicians who receive the questionnaire.

Yours very sincerely,

R. G. LELAND, M. D.,
Director of Study.

The questionnaire alluded to in the letter calls for information which will tend to show the cost of medical education and included such expenses of the student, as tuition, special fees, living expenses, medical books, journals and stationery and instruments, car fare and traveling expenses, life insurance premiums and interest on all borrowed principal. Another item covers the cost of the office and other necessary equipment together with the cost of maintenance, as well as the cost of office assistants, medical books, journals, society dues, and expense of traveling to medical society meetings.

It will be noted from the above letter that every physician will not receive one of these blanks but in order to arrive at a cross section of the physicians of the whole country, 25,000 will be selected at random. It is therefore highly important that every physician receiving one of these questionnaires should co-operate by supplying this data prompty.

Dr. Victor Vinnette Wallace of Carrollton, Miss., died of pneumonia at his home on December 23, 1928, and was buried by the Masonic Lodge on December 24th.

Dr. Wallace was born in Carroll County on October 15, 1878. He attended the public schools in this county and was a graduate of the Memphis Medical College of the class of 1908. He served as interne in the City Hospital of Memphis, after which he began practice in Old Salem, Carroll County, Mississippi. In 1919 he moved to Carrollton. He was a member of the Winona District Medical Society.

The Journal wishes to take this occasion to express its sympathy to his bereaved family.

ISOLATION OF PITUITARY HARMONES.— For his work in an investigation of the ductless glands and particularly in his isolation of pituitary hormones, Dr. Oliver Kamm, director of chemical research of Parke, Davis & Company, manufacturing chemists, has been awarded the $1000 prize by the American Association for the Advancement of Science for the "most noteworthy contribution to science presented at the annual meeting." The award was announced on January 2 by Dr. Henry Fairfield Osborn, president of the association.

The isolation of two harmones from the posterior lobe of the pituitary gland is held by chemical scientists to be equal in importance to the isolation of insulin and the discovery of adrenalin. Dr. Kamm isolated the alpha and beta hormones of the posterior pituitary after twelve years work in the Parke, Davis Research Laboratories. This, incidentally, is the first time that anyone has demonstrated that one gland might contain more than one harmone.

The alpha harmone is the so-called oxytocic principle. The beta harmone is the blood-pressure-raising principle. Dr. Kamm also showed definitely that the beta hormone has the power of controlling the excessive output of water. His paper before the American Association for the Advancement of Science showed that it has been a mistake to refer to the so-called "renal activiay" of pituitary extracts.

The beta harmone does not act upon the kidneys, but controls the utlization of water by the individual tissues of the body.

The usefulness of this beta hormone is now under investigation in diseases characterized by excessive loss of water, such as diabetes insipidus, burns, cholera, other infections diseases, and surgical shock.

BOOK REVIEWS

Stedman's Medical Dictionary: By Thomas Lathrop Stedman, A. M., M. D. New York, William Wood & Company. 1928. pp. 1194.

The tenth edition of this standard dictionary appears in exactly the same form as the last few editions. About 500 new medical terms have been added, and a considerable number of obsolete words have been deleted. In addition to these features a table of microparasites has been prepared which will aid very materially those unfamiliar with the new nomenclature of the American Society of Bacteriology.

This dictionary we consider to be the best in the English language. We have used recurring additions since the first one came out in 1911, and we have always been able to find the word we sought, clearly and intelligently defined.

J. H. MUSSER, M. D.

Nutrition: By Walter H. Eddy, Ph.D. Baltimore, Williams & Wilkins. 1928. 237 pp.

This little bok will appeal to layment and students of medicine for whom it is primarily written. Any intelligent layman can with some application and cooncentration absorb the gist of it as the language is not technical and the style is clear. Many practitioners would do well to peruse this little volume as a result of which many terms such as "respiratory quotient", basal metabolism, vitamins etc. would have greater significance.

The author has avoided dogmatism and theorizing as far as possible. The first eight chapters consider general food requirements. The last eight chapters take up the subject of vitamins and vitamin requirements. It appears to the reviewer that this last half might well have been condensed for the purposes of this book but it is quite apparent that this subject is a hobby of the author—It should be condoned, however, as it contains a great deal of sound information.

RANDOLPH LYONS, M. D.

History of Pathology: By Esmond R. Long, Ph.D., M. D. Baltimore, Williams & Wilkins Co. 1928. pp. 291.

This is a small, well written and concise volume devoted to the origin and evolution of pathology. The material is necessarily brief but the author has most excellently condensed the subject matter so that little of importance has been deleted. The approach is largely biographical. There is an excellent foreword by Lt. Col. F. H. Garrison. There are many most interesting photographs and illustrations. It is well worth the reading.

I. L. ROBBINS, M. D.

Goiter Prevention and Thyroid Protection: By Israel Bram, M. D. Philadelphia, F. A. Davis Co. 1928. pp. 327.

In this small treatise on the thyroid and its diseases and influence on human economy, the author frankly admits that the thyroid is the great regulator of the life processes of the individual and deals with its social, psychological and spiritual influence on the activities of man. It is written for both the non-medical as well as the medical public. The author has been writing on the thyroid for years and knows whereof he speaks. It is well presented, interesting and apparently scientifically sound in general. There are many details on diet and the use of iodin, with which one may take exception, but the author quotes good authority and states a vast personal experience to support his views.

I. L. ROBBINS, M. D.

PUBLICATIONS RECEIVED.

W. B. Saunders Company, Philadelphia and London: A Textbook of Surgery, by W. Wayne Babcock, A. M., M. D., F. A. C. S.

P. Blakiston's Son & Company, Philadelphia: A Compend of Diseases of the Skin, by Jay Frank Schamberg, A. B., M. D.

J. B. Lippincott Company, Philadelphia and London: International Clinics, Volume IV, 38th series. 1928. Pediatrics for the General Practitioner, by Harry Monroe McClanahan, A. M., M. D.

Oxford University Press, New York: Treatment of Venereal Disease in General Practice, by E. T. Burke, D. S. O., M. B., Ch.P. A Handbook for the Diabetic, by Albert H. Rowe, B. S., M. S., M. D. Child Health and Character, by Elizabeth M. Sloan Chesser, M. D. Qualitative and Volumetric Analysis for Medical Students, by H. Lambourne, M. A., M. Sc., F. I. C., and J. A. Mitchell, M. Sc. Lipiodol in the Diagnosis of Thoracic Disease, by F. G. Chandler, M. A., M. D., F. R. C. P. and W. Burton Wood, M. A., M. D., M. R. C. P. Methods of Biological Assay, by J. H. Burn, M. A., M. D.

Paul B. Hoeber, Inc., New York: William Harvey, by Archibald Malloch, M. D., M. R. C. P. Microscopical Technique, edited by C. E. McClung, Ph.D.

Harvard University Press, Cambridge: Physician and Patient, edited by L. Eugene Emerson.

Tulane University Press, New Orleans: Angina Pectoris: Anatomy, Physiology and Surgical Treatment, by Walter B. Caffey, M. D., F. A. C. S., and Philip King Brown, A. B., M. D., and John Davis Humber, B. S., M. D.